Remarkables Ski Area Upgrade and Doolans Expansion Lizard Assessment & Management Plan

NZSki Limited

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Remarkables Ski Area Upgrade And Doolans Expansion -
Lizard Assessment & Management Plan

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Document Status

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1 Introduction

1.1 Overview

The current Remarkables Ski Area is in the upper catchment of the Rastus Burn Recreation Reserve at elevations above 1500 m a.s.l. NZSki Limited (NZSki) has undertaken a range of development activities within the Ski Area since the 1970s. NZSki is proposing a Remarkables Ski Area Upgrade and Doolans Expansion Project (the Project; REP). This includes expansion of the current ski field operational footprint (in the Rastus Burn Recreation Reserve) into the adjacent Doolans Basin (**Figure 1**). The ridgeline separating the Doolans catchment from the Rastus Burn is also the boundary of the Central Otago and Queenstown Lakes district councils. Both the Rastus Burn Recreation Reserve and the Remarkables Conservation Area are crown-owned Public Conservation Land parcels managed by the Department of Conservation (DOC).

This Lizard Assessment and Management Plan (LMP), including assessment, has been prepared to describe and manage effects on indigenous lizards arising from the Project. It is informed by a comprehensive desktop review and an extensive field-based lizard survey undertaken during the 2024/25 and 2025/26 lizard active seasons. These review and surveys were undertaken to identify lizard species and habitats present, and to inform management to meet statutory requirements.

1.2 Remarkables Ski Area Upgrade and Doolans Expansion Project Description

The earthworks footprint for the Project is detailed in **Figure 1** above and encompasses 15.9 ha of terrestrial habitats.

The key project works proposed within the existing Remarkables Ski Area are summarised below and include:

- Upgrades to existing infrastructure services and associated structures including upgrades to mains power supply, infield power distribution, water, wastewater, stormwater, communication, and snowmaking.
- Expansion of the existing Rastus Burn Base Building and reconfiguration of the arrival surrounds.
- Construction and use of the new Doolans Gondola providing access into the Doolans Basin, including construction of the new Base Station adjacent to the Rastus Burn Base Building and construction of gondola towers, cables and associated infrastructure up to the new Helicopter Ridge Mid station.
- Upgrades to existing and establishment of new access roads and ski trails to provide vehicular access and ski return trails to and from the Doolans Basin.
- Installation of new operational controls to maintain the health and safety of ski field users. Such controls include wayfinding signage, barriers/gates, permanent safety fencing/netting, snow fences, avalanche control, boundary markers.

Refer to the full project description contained in the substantive application for further details and plans relating to the above.

The key project works proposed within the Doolans Basin are summarised below and include:

- Establishment and use of the new Doolans Gondola from the Rastus Burn Base Building into the Doolans Basin. The new gondola includes the new Base Station directly adjacent to the existing Rastus Burn Base Building, the new Helicopter Ridge Mid-station (with a patrol hut), and the new Doolans Return Station directly adjacent (and connected) to the proposed Doolans Cabin Building. It also includes construction of gondola towers, cables and associated infrastructure.
- Establishment and use of a new multi-purpose Doolans Cabin Building, designed to accommodate gondola cabin parking, integrated cabin maintenance, storage, bathroom facilities, café facilities and emergency shelter space.
- Establishment and use of ski trails and access roads between the gondola mid-station, the Doolans Cabin Building and associated infrastructure. Where practicable, ski trails and access roads will be co-located to minimise the level of ground disturbance.
- Construction of a learners snowsports area adjacent to the Doolans Cabin Building with a covered passenger conveyor lift, supported by snowmaking infrastructure.
- Establishment of supporting services and facilities in the Doolans Basin, including power, water, wastewater, stormwater, communications and snowmaking facilities.
- Installation of new operational controls to maintain the health and safety of ski field users. Such controls include wayfinding signage, barriers/gates, permanent safety fencing/netting, snow fences, avalanche control, boundary markers.

Refer to the full project description contained in the substantive application for further details and plans relating to the above.

1.3 Statutory Context

This assessment and LMP has been prepared to address the relevant information and statutory requirements of the following legislation:

- Fast-Track Approvals Act 2024;
- Conservation Act 1987;
- Wildlife Act 1953; and,
- Resource Management Act 1991.

All indigenous lizard species, including those classified as Not Threatened, are afforded absolute protection under the Wildlife Act 1953 and its subsequent amendments. Accordingly, any activity that may disturb, harm, or otherwise affect indigenous lizards requires a Wildlife Act Authority (WAA) issued by DOC.

For projects processed under the Fast-Track Approvals Act 2024 (FTAA) a WAA may be issued concurrent with resource consent. The information requirements necessary to support a WAA application under the FTAA are specified in Schedule 7 of that Act. The FTAA checklist specific to this LMP is detailed in **Appendix 1**.

1.4 Site Description

The LMP site is located on the eastern side of Lake Whakatipu, at the northern end of the Remarkables Range (**Figure 1**). It encompasses the headwaters of the Rastus Burn and the western extent of the right branch of Doolans Creek. The upper elevations consist of alpine cirques and basins characterised by steep ridgelines, exposed slopes, and irregular depressions. Above approximately 1600 m a.s.l., rockfield environments dominate, transitioning downslope into cushionfield, snow tussock, and *Dracophyllum* scrub communities. Wetlands are distributed throughout the site at a range of altitudes, and several significant waterbodies occur within the area, including three sizable tarns and Lake Alta. **Appendix 2** provides a description of the vegetation communities within the LMP with supporting photographs.

The Rastus Burn Recreation Reserve has undergone several phases of modification associated with establishment and operation of the existing Remarkables Ski Area. In contrast, the Doolans Basin remains largely undeveloped. Although the basin has a history of pastoral grazing and fire, it contains no modern infrastructure and retains comparatively intact alpine and subalpine environments.

1.5 LMP Objectives

The objectives of this LMP are to ensure the effects on lizards are managed and/ or compensated for in an ecologically appropriate manner.

The LMP achieves this objective by:

1. Describing the lizard values of the LMP site.
2. Identifying the actual and potential effects of the Project.
3. Describing the effects management and compensation.

1.6 Limitations and Disclaimers

e3Scientific Limited (e3s) performed the services referred to in this report in a manner consistent with the normal level of care and expertise exercised by members of the environmental science profession. No warranties, express or implied, are made. The outcomes are limited by the Scope of Work, and the parameters in which field work was able to be undertaken. The work was designed to maximise confidence in the results, however, all lizards may not have been seen or recorded.

The results of this assessment are based upon site inspections conducted by e3s personnel, and information found through desktop research, including scientific literature. All conclusions and recommendations regarding the site are the professional opinions of e3s personnel involved with the project, subject to the qualifications made above. While normal assessments of data reliability have been made, e3s assumes no responsibility or liability for errors in any data obtained from regulatory agencies, statements from sources outside e3s, or developments resulting from situations outside the scope of this project.

1.7 Code Of Conduct

The author of this report is Trudy Anderson. She is a Senior Environmental Scientist – Terrestrial Ecology at e3s. She holds a BSc in Ecology and a Post-Graduate Diploma in Wildlife Management (with Distinction), both from the University of Otago. She has over twenty years of professional experience working as an ecologist, including undertaking survey, monitoring, research, and conservation management. This work focused on dryland, tussock grassland, and shrubland ecosystems and species in inland Otago including lizards, fish, birds, invertebrates and plants.

The senior review and technical input for this report was undertaken by Carey Knox who is an independent ecological consultant, researcher, and wildlife photographer specialising in herpetology and Lepidoptera. Carey holds an MSc degree in Zoology from the University of Otago and has 17 years of contracting experience with lizard projects across New Zealand, with particular expertise in alpine habitats of the South Island. Carey is currently undertaking a PhD (part-time) through the University of Otago using drone technology to locate lizards in inaccessible habitats throughout Aotearoa.

We confirm that we have read the Code of Conduct for expert witnesses contained in the Environment Court Practice Note 2023. This report has been prepared in compliance with that Code, as if it was expert evidence presented in proceedings before the Environment Court. Unless stated otherwise, this report is within our area 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 Lizard Values of the LMP Site

This assessment and LMP is informed by a desktop review of existing lizard information supported by comprehensive field surveys undertaken during the 2024/25 and 2025/26 lizard active seasons.

2.1 Desktop Assessment

2.1.1 Methods

A desktop assessment was undertaken to compile existing information on indigenous lizard species and their habitats in the LMP site. The assessment drew on the following sources:

- A botanical assessment describing vegetation communities and identifying actual and potential lizard habitats in the LMP site (e3Scientific, 2026c).
- Existing scientific literature, including the DOC Herpetofauna Database, DOC's threat classification for New Zealand reptiles (Hitchmough, et al., 2026), and the Regional Conservation Status of Reptile Species in Otago (Jarvie, et al., 2024).
- Previous herpetofauna surveys and assessments undertaken within, or in proximity to, the LMP site (Jewell, 2024) (Tocher, 2024) (Whitaker, 1986) (Whitaker, et al., 2002) (Wildlands Consulting Ltd, 2020a) and (Wildlands Consulting Ltd, 2021).
- Review of existing ecological information to determine terrestrial vegetation habitats and species likely to be present.

Information from these sources was collated and evaluated to identify lizard species likely to occur within the LMP site, assess the extent and distribution of suitable habitat, and inform subsequent field survey design.

2.1.2 Results

Based on the desktop assessment, two lizard species are considered to have a moderate-high likelihood of occurrence within the LMP site: McCann's skink (*Oligosoma maccanni*), and a newly recognised entity described as *O.* aff.

inconspicuum "Central - Southern". This new entity amalgamates what was previously known as the pallid skink (*O.* aff. *inconspicuum* "pallid") and the cryptic skink (*O. inconspicuum* senso stricto) and is based on recent genomics work (Hitchmough *et al.* 2026) (**Table 1**). Several other lizard species are known from the Remarkables Range and surrounding areas; however, based on current knowledge of their distribution and aspects/habitats, they are unlikely to occur at the LMP site (**Table 1**).

2.1.2.1 McCann's skink

McCann's skink is assessed as having a 'High' likelihood of occurrence at the LMP site (**Table 1**). Historical through to present day observations indicate that McCann's skinks are common and widespread in virtually all habitat types up to 1550 m a.s.l. in the Remarkables Range (Patterson & Patrick, 1984) (Wildlands Consulting Ltd, 2020a). Above 1550 metres, McCann's skinks are sparser in occurrence, favouring north-facing slopes and are rarely found above 1650 metres a.s.l. (C. Knox pers. obs.).

2.1.2.2 O. aff. inconspicuum "Central - Southern"

The desktop assessment identified a single 'cryptic skink' record near the current access road below the base building (this population was later genetically sampled and found to be O. aff. inconspicuum "Central - Southern"). Central-Southern skinks have also been recorded from a few other small pockets of habitat west of the LMP site in the Rastus Burn. Apart from McCann's skink, *O.* aff. *inconspicuum* "Central - Southern" is the only skink species likely to occur at the higher elevations of the LMP site. This is supported by records from Mt Cardrona, where the taxon has been found at the summit (1936 m a.s.l.), representing the highest confirmed altitude for any New Zealand skink. Although this species is known to occur at high elevations, it also appears to be of patchy occurrence, suggesting a degree of habitat specialisation. On this basis, *O.* aff. *inconspicuum* "Central - Southern" is assessed as having a 'Moderate - High' likelihood of occurrence (at least somewhere within the LMP site) (**Table 1**).

2.1.2.3 Short-toed gecko

Short-toed geckos are recorded from lower elevations in the Rastus Burn Recreation Reserve (900–1350 m; (Wildlands Consulting Ltd, 2020a)) and from a single site in Doolans Creek at ~1065 m a.s.l. (Whitaker, 1986). Although their potential elevational range spans 700–1700 m a.s.l. (New Zealand Herpetological Society, 2026), suitable

rocky habitat (e.g. tors, bluffs, boulderfield, or fell-field) within the LMP site is limited. Consequently, the species is assessed as having a 'Low - Moderate' likelihood of occurrence in the LMP site (**Table 1**).

2.1.2.4 Southern grass skink

Southern grass skink (*Oligosoma chionochloescens*) is the updated name for tussock skink (Hitchmough, et al., 2026). This species has been recorded up to 1700 metres in Otago (C. Knox pers. obs.) indicating that the LMP site is within their potential elevation range; however, the species has never been recorded from the Remarkables, despite numerous lizard surveys within the range by several herpetologists. Southern grass skinks are also extraordinarily rare (although present) in adjacent areas such as the Nevis Valley and Hector Mountains (C. Knox pers. obs.). Based on this, the species is assessed as having a 'Low' likelihood of occurring within the LMP site (**Table 1**).

2.1.2.5 Other Potential Lizard species

The orange-spotted gecko has been assessed as having a Moderate likelihood of occurrence primarily due to records 16-23 km south and 11 km north-east of the LMP site (in the Hector Mountains and Crown Range (Department of Conservation, n.d.)). Orange-spotted geckos occur in tor, scree, boulderfield, and talus habitats (Knox, et al., 2019) (**Table 1**).

Based on desktop review all other lizard species are deemed to have a Low (or Very Low) likelihood of occurrence. Nevis skink and lakes skink are possibly present in either the Rastus Burn or Doolans catchments. Regarding these (and other large-bodied skinks), Whitaker (1986) carried out a comprehensive survey of the Remarkables, focussing on altitudes below 1500 m a.s.l.. This study failed to detect any such species. For this reason, Nevis and lakes skinks have been assessed as having a Low likelihood of occurrence (**Table 1**).

Two *Woodworthia* gecko species, mountain beech gecko and Kawarau gecko, are known from the wider area but neither species occurs above 1,200 metres a.s.l. Thus, both species were considered highly unlikely to occur within the LMP site.

Table 1: Lizard Species and Likelihood of Occurrence at the LMP Site Based on Desktop Assessment.

Species	NZTCS Conservation Status (Hitchmough *et al.*, 2026)	Conservation status of reptile species in Otago, 2025 (Jarvie *et al.*, 2025)	Likelihood of Occurrence	Notes
McCann's skink *(Oligosoma maccanni)*	Not Threatened	Not Threatened	High	Includes all references to 'spotted' form of this common skink. Known at similar altitudes elsewhere on the Remarkables, including the Rastus Burn catchment.
Central-southern skink *(O. aff. inconspicuum* "Central - Southern")	At Risk – Declining	Not listed. Former entities At Risk – Regionally Declining.	Moderate-High	Includes all references to cryptic skink, pallid skink, and "speckled" form of common skink. This taxon is known from the Rastus Burn adjoining the site and occurs at very high elevations; however, is of very patchy occurrence. Also recorded in Nevis Valley at 700 m a.s.l. (Wildlands Consulting Ltd, 2020b).
Orange-spotted gecko *(Mokopirirakau* "Roys Peak")	At Risk - Declining	At Risk - Regionally Declining	Moderate	Not known to occur in the Remarkables Range but are known from the Hector Mountains, Crown Range, and Moke Valley near Queenstown.
Short-toed gecko *(Woodworthia "southern mini")*	At Risk - Declining	At Risk - Regionally Declining	Low - Moderate	Known from near the lower altitudes of the LMP site on the Rastus Burn side. Whitaker *et. al* 1986 records 'mini' gecko in one place in Doolans Creek up to 1,065 m and over western flanks of Remarkables. Suitable habitat is limited within the LMP site.
Southern grass skink *(Oligosoma chionochloescens)*	At Risk - Declining	At Risk - Regionally Declining	Low	This species has been recorded up to 1,700 metres in Otago indicating that the LMP site is within their potential elevation range; however, the species has never been recorded from the Remarkables, despite numerous lizard surveys.
Nevis skink *(Oligosoma toka)*	At Risk - Declining	At Risk - Regionally Declining	Low	Nearest record from Nevis catchment at 750 m asl (Wildlands Consulting Ltd, 2020b). Likely to have been misidentified as McCann's skink in the past; occurs between 660 to 1920 m a.s.l.
Lakes skink *(Oligosoma aff. chloronoton* "West Otago")	Threatened - Nationally Vulnerable	Threatened - Regionally Vulnerable	Low	Known to occur up to 1600 m a.s.l. but not known to occur in the Remarkables Range. The nearest known population is on Mount Cardrona.

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2.2 Lizard Survey of the LMP Site

2.2.1 Lizard Survey – Methods

2.2.1.1 Overview of Approach

Prior to a single brief skink observation near Lake Alta in November 2024, no lizards had been confirmed from high altitude environments in the Remarkables Ski Area. Earlier walk-through surveys by experienced herpetologists in the upper Rastus Burn detected no lizards, and the high-altitude areas of the Doolans catchment remained unsurveyed. The November 2024 sighting provided the first verified evidence of lizard presence at higher elevations and demonstrated that walk-through methods were insufficient for reliably detecting cryptic or low-density populations. In response, the proposed survey approach was strengthened through the deployment of Gee's minnow traps to materially improve detectability across all habitats, in addition to Manual Habitat Searches (MHSs). This decision was also informed by outcomes at Cardrona, where reliance on walk-through surveys had missed two species and substantial numbers, and only targeted trapping during salvage accurately quantified lizard presence.

2.2.1.2 Gee's Minnow Survey – Site Selection

A GIS-based terrain analysis was undertaken across the site and adjacent areas to ensure comprehensive spatial coverage. This analysis enabled systematic stratification of Gee's minnow trap locations across all vegetation communities, altitude bands, and aspects likely to support lizard populations (**Table 2**). A total of 66 trap sites were selected through this process and subsequently surveyed: 23 in the existing Remarkables Ski Area and 43 in the Doolans catchment (**Figure 2**).

There was a purposeful decision not to trap the Disturbed Vegetation community due to the lack of lizard habitat. Snowbank vegetation was also not trapped due to the extremely small extent of the habitat and similarity to High Alpine Cushionfield from a lizard habitat perspective.

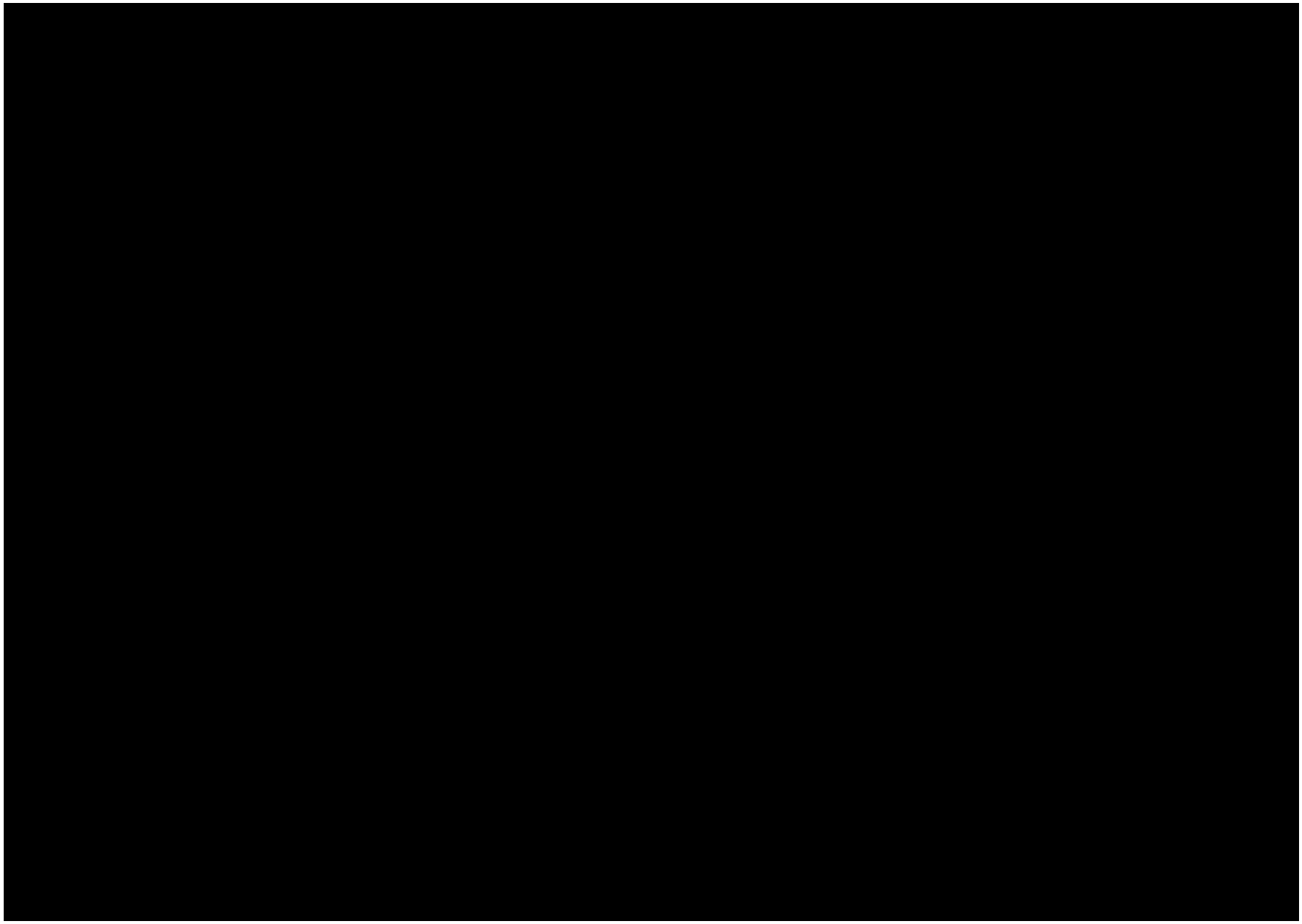


Table 2: Lizard Trapping Sites by Vegetation Community.

Vegetation Community*	Number of Trapping Sites
Snow Tussock Grassland	11
North Facing *Chionochloa* Tussock Grassland	10
Dracophyllum Scrub	3
Cushionfield	10
High Alpine Cushionfield	2
Rockfield	12
Rocky Outcrop	4
Seepage/Riparian Wetland	8
Cushion bog	4
Tarn (at edge)	2

*See vegetation community descriptions in **Appendix 2**.

2.2.1.3 Gee's Minnow Trapping Methods

At each Gee's minnow site, 10-20 lizard grade (1/8-inch mesh (3.18 mm)) traps were deployed in specialised patterns (grids or lines) that best fitted the terrain. Trap spacings were at approximately 10 m with minor adjustments made to ensure traps were placed in the most preferable lizard habitat at each site. Traps were baited with tinned pear, contained a moist sponge, and were covered with shade cloth. Traps were checked daily with any lizards found, recorded and released. Sponges were re-moistened daily and pear was replaced every second day.

2.2.1.4 Gee's Minnow Trapping Effort

Gee's minnow traps were deployed at each trapping site for a maximum of five days in weather conditions suitable for lizard activity. Traps remained open only when daytime temperatures exceeded 12°C, if temperatures fell below this threshold for more than one day, traps were closed and reopened once conditions improved (**Appendix 3**). Due to cold weather, 10 trapping sites were operational for only three days rather than the targeted five (sites 1, 2, 3, 4, 5, 7, 8, 13 and 16). As a result, data from some of these sites are considered low confidence and do not fully represent potential lizard presence (further information is detailed in **Appendix 4**).

Across the 2024/25 and 2025/26 lizard active seasons, a total of 5,470 trap days were completed. This represents an unprecedented survey effort in an alpine environment

and provides a robust basis for assessing lizard presence and distribution, and appropriate management at the LMP site.

2.2.1.5 Manual Habitat Searching

Manual Habitat Searching (MHS) was undertaken across the LMP site by Tony Jewell over the 2023/2024 lizard active season (Rastus Burn catchment only); and by e3s[i] during the 2024/2025 and 2025/2026 lizard active seasons, totalling >60 person hours[ii]. Searches followed standard herpetofauna survey protocols and involved:

- Visual scanning of rock surfaces and vegetation for active or basking lizards; and,
- Lifting rocks and other natural cover to detect lizards, shed skins, and droppings.

All searching was undertaken only in weather suitable for lizard activity (≥ 12 °C, light winds, no precipitation) (**Appendix 3**).

MHS by e3s was completed concurrently with vegetation assessment in 2024/25 and 2025/26 (**Appendix 3**). Additional searching occurred at and around Gee's minnow trap locations during trap deployment and daily checks. Opportunistic observations were also recorded while moving between survey areas. The spatial extent of some of this search effort is shown in **Appendix 5.**

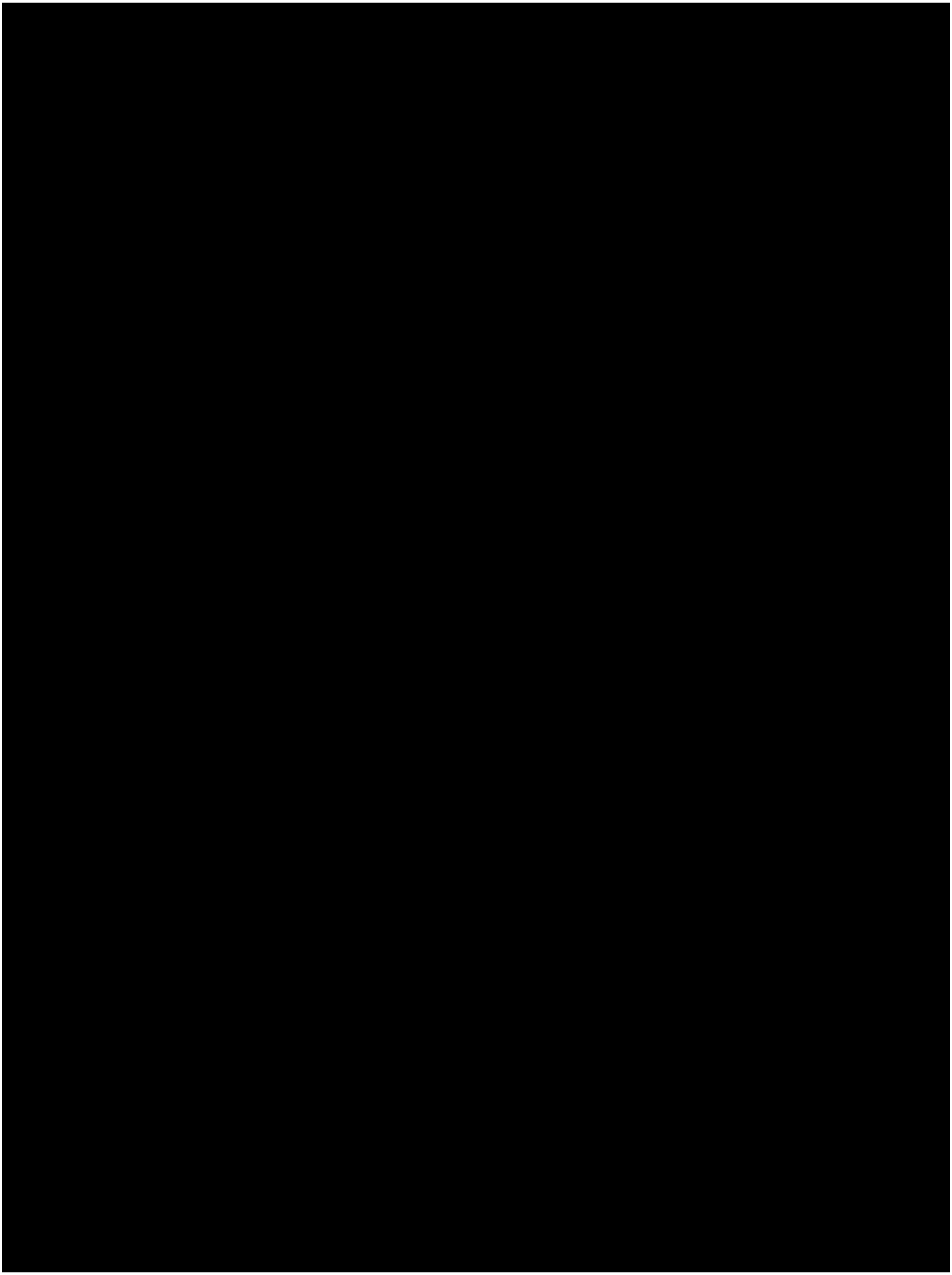
2.2.2 Lizard Survey – Results

2.2.2.1 Lizard Species

Only McCann's skink were found in the LMP site (**Figure 3** and **Plate 1**), occurring mostly below 1600 m in both the Rastus Burn and the Doolans catchment. In surveyed areas above 1600 m a.s.l, McCann's skink was present but not abundant; their distribution appears to be confined to north facing tussock slopes at higher altitudes. McCann's skinks were very abundant in the Doolans trapping sites below 1500m. Lizard records from this survey are detailed in **Appendix 6**.

[i] Trudy Anderson, Liam Salemink Waldren, Lisa Milliken and Annie Wardle under the direction of Dr Mandy Tocher.

[ii] This includes the 19 hours carried out by Tony Jewell in the Rastus Burn catchment over the 2023/24 season.



localised pockets on north facing slopes. Short-toed geckos are currently known only at lower elevations in the Rastus Burn catchment (below 1300 m a.s.l.) (**Figure 3**).

Overall, lizards are not a stand-out ecological feature of the LMP site. Despite extensive Gee's minnow trapping and MHSs, large areas do not contain any lizard species.

2.2.2.2 Lizard Habitats of the LMP Site

Of the ten vegetation communities in the LMP site that were trapped, six of these were successful in detecting McCann's skinks (**Table 2** and **Appendix 2**). No other lizard species were found. The areas within the LMP site that are likely to provide lizard habitat (based on survey results, altitude, aspect, and vegetation) are mapped in **Figure 4** and described in **Table 3** below.

Table 3: Habitats Known to Support McCann's Skink at the LMP Site.

Vegetation Community	Lizard Habitat Within Earthworks Footprint		Total Lizard Habitat Within LMP Site	
	Hectares below 1600 m a.s.l.	Hectares above 1600 m a.s.l.	Hectares below 1600 m a.s.l.	Hectares above 1600 m a.s.l.
Snow Tussock Grassland	1.14	*	36.47	*
North Facing Tussock Grassland	1.23	0.84	14.37	18.58
Dracophyllum Scrub	0.15	No habitat present	7.87	No habitat present
Cushionfield	0	*	0.32	*
High Alpine Cushionfield	No habitat present	*	No habitat present	*
Snowbank+	No habitat present	*	No habitat present	*
Rockfield	0.01	*	0.08	*
Rocky Outcrop	0	*	0.17	*
Wetland – Seepage/ Riparian, Tarn (at edge) and Cushion Bog.	0.09	*	7.51	*
Disturbed Vegetation+	*	*	*	*
Total	**2.62**	**0.85**	**66.91**	**18.58**

+These habitats were not trapped, only surveyed using manual habitat searching.
* No lizards were found in these habitats.

Within the LMP site above 1600 m a.sl, only North Facing Snow Tussock Grassland is likely to support lizards (4 of 8 trapping sites detected lizards). All the trapping sites above 1600 m a.sl in Cushionfield (3), Wetland (3 Cushion Bog and 2 Tarn at edge), Rockfield (4), High Alpine Cushionfield (2), Snow Tussock Grassland (6) and Tarn (At Edge; 2), were unsuccessful at detecting lizards, giving a high confidence in this result.

Below 1600m, 2 of 5 Wetland (Seepage/Riparian), 1 of 5 Snow Tussock Grassland, 3 of 4 North Facing Tussock Grassland, 2 of 6 Rockfield, 1 of 1 Rocky Outcrop, and 2 of 3 *Dracophyllum* Scrub trapping sites were successful in detecting McCann's skink. The likely McCann's skink habitat within the LMP site, based on the habitats and altitudes in which they were found, is approximately 85.5 ha (all habitats below 1600 m a.s.l. and north-facing tussock above 1600 m a.s.l. (**Figure 4** and **Table 3**).

Overall, the absence of lizard detections over large areas of the LMP site (as shown in **Figure 4** and **Table 3**), suggests that habitat suitability for McCanns skink in the LMP site is strongly influenced by aspect at higher altitudes.

2.3 Significance of Lizard Habitats at the LMP site

The following sets out a review of the ecological significance of habitats with respect to national, regional, and territorial authority assessment criteria.

2.3.1 DOC guidelines for Assessing Significant Ecological Values (Davies, et al., 2016)

Public Conservation Land of the LMP site that provides habitat for At Risk or Threatened lizard species trigger the 'Rarity and special features' criterion in the DOC guidelines. No At Risk or Threatened lizard species are only known to be present in the LMP area. Therefore, no areas are considered significant.

2.3.2 National Policy Statement for Indigenous Biodiversity (Ministry for the Environment, 2023)

Areas within the LMP site that provide habitat for At Risk or Threatened lizard species qualify as a significant natural area (SNA) under Appendix 1 of the National Policy Statement for Indigenous Biodiversity (NPS-IB). No At Risk or Threatened lizard species are known to be present in the LMP area. Therefore, no areas are considered significant.

2.3.3 Otago Regional Policy Statement 2023

Section 6(c) of the Resource Management Act 1991 requires both Regional and District Councils to recognise and provide for the protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna. Schedule 4 of the Otago Regional Policy Statement sets out criteria to assess whether an area qualifies as a significant habitat of indigenous fauna under Section 6(c) of the Resource Management Act 1991. Only one of these criteria needs to be met for the site to be considered significant, in which case it becomes subject to Policies 3.1.9, 3.2.1, and 3.2.2. The rarity criterion is triggered by the presence of At Risk or Threatened lizard species. No At Risk or Threatened lizard species are known to be present in the LMP area. Therefore, no areas are considered significant.

2.3.4 Queenstown Lakes District Council District Plan (applicable for Rastus Burn catchment only).

Areas of the LMP site that provide habitat for At Risk or Threatened lizard species qualify as significant under the rarity criteria of Policy 33.2.1.8. No At Risk or Threatened lizard species are known to be present in the LMP area. Therefore, no areas are considered significant.

2.3.5 Central Otago District Council District Plan (applicable for Doolans catchment only).

Areas of the LMP site that provide habitat for At Risk or Threatened lizard species qualify as significant under the rarity criteria of Section 04 of the CODC District Plan. No At Risk or Threatened lizard species are known to be present in the LMP area. Therefore, no areas are considered significant.

2.3.6 Wildlife Act 1953

As detailed in Section 1.3, all indigenous lizard species are absolutely protected under the Wildlife Act (1953), including the 'Not Threatened' McCann's skink. An authority is required from the DOC to carry out works in the habitats of absolutely protected wildlife. For works within the LMP site, NZSki are seeking a Wildlife Act authorisation issued concurrently with Resource Consent under the Fast-Track Approval Act (2024).

3 Assessment of Effects

There will be temporary and long terms adverse effects to lizards should no avoidance or remediation actions be carried out. These effects include:

Temporary Effects

- Vegetation clearance and soil disturbance.
- Noise and vibration from machinery and vehicles.
- Damage to vegetation and habitat features (rock/scree).
- Displacement and social disturbance of lizards.
- Sediment runoff affecting microhabitats and prey.
- Creation of exposed areas increasing predator risk.
- Injury or death resulting from construction activities.

Ongoing Effects

- Permanent habitat loss or modification.
- Habitat fragmentation and edge effects.
- Ongoing disturbance from maintenance access.
- Increased vehicle use leading to disturbance, and possible injury/death.
- Light/noise pollution altering behaviour.
- Increased predator movement due to roading and disturbed areas.
- Reduced vegetation cover and diversity in rehabilitated areas.

Adverse effects are expected should no avoidance, mitigation, or remediation actions be carried out. Any lizards present on or near the earthworks footprint of an activity may be subject to displacement, social disturbance, minor injury, serious injury, or death as a result of the activity.

Displacement and social disturbance are an outcome of nearby noise and vibration generated during activities over the construction area (e.g., excavator movements, drilling and blasting to install foundations, and foot traffic). Disturbance by habitat destruction, noise, and vibration may cause lizards to move away (be displaced) from preferred retreat sites, and foraging and basking sites. The impact of this displacement can elevate predation risk, alter levels of intra-lizard species interactions/competition and reduce survival of lizards during extreme weather (due to loss of retreat sites). The scale and significance of noise, vibration and dust impacts on individuals is not possible to ascertain with certainty, but maybe a significant (though sometimes temporary) effect for a small number of individuals.

The impact of injuries (such as tail or limb loss) can be significant for the individual. Any injury can impact survival, agility, social interactions, and increase vulnerability to predation. If a tail is lost, it is very energy-intensive to replace and adds physiological stress to the individual. The additional energy required to regrow the tail is particularly problematic in cold weather and can impact reproduction.

3.1 Individual Lizard Effects

The likely number of McCann's skinks affected by the Project is estimated to be 300-600. Due to the survey undertaken there is high confidence that no Threatened or At Risk species will be impacted.

3.2 Lizard Population Effects

The extent of lizard habitat in the earthworks footprint is 3.47 ha (**Table 3** and **Figure 4**). This is approximately 22% of the earthworks footprint (15.9 ha), 4 % of the estimated 85.5 ha of lizard habitat in the LMP site and 0.8 %of the LMP site (413.35 ha). The removal of this habitat is not expected to have any impact on the viability of the national McCann's skink population. This conclusion reflects the species' current 'Not Threatened' status under the Department of Conservation's threat classification system and its wide distribution across Southland, Otago, and Canterbury. At the local scale, within the Remarkables Range, the population is also not expected to be adversely affected given the extent of available habitat and the relatively small proportion impacted.

3.3 Significance of Effects

The effects detailed above are significant in the absence of management due to all lizards being absolutely protected under the Wildlife Act (as per (Department of Conservation, 2018)).

4 Effects Management

4.1 Effects Management Overview

The effects management detailed below includes measures to avoid, minimise, remediate, and mitigate effects, and concludes with compensation actions to address any residual adverse effects that are not fully managed through the mitigation hierarchy. When implemented effectively, the package will ensure that lizard populations will continue to persist within all lizard areas affected by NZSki development projects.

4.2 Avoidance

NZSki has situated infrastructure within the footprint of existing disturbed areas, or in areas that are unlikely to contain lizards, wherever possible.

4.3 Remediation

Remediation will occur to support vegetation values, but it is not expected that this will have any beneficial impact on lizards.

4.4 Mitigation

4.4.1 Lizard Salvage

No lizard salvage will be undertaken. This will result in injury, death and displacement of 300-600 McCann's skink in and near the earthworks footprint. The effects of this are addressed through compensation.

4.4.2 Habitat Reduction

Prior to vegetation clearance, vegetation will be reduced within the earthworks footprint (plus a 1 m buffer) in places where skinks are expected to be present that overlap with the construction footprint (yellow shading in **Figure 4**). The purpose of this is to minimise injury and death by removing suitable habitat and giving them the opportunity to move to other habitat nearby. This has been successful in lower altitude locations with exotic grasses but is not known to have been used in an alpine environment. Nonetheless, we expect it to reduce the overall number of skink injuries

and deaths during construction, as individuals will be less likely to occur in the footprint as opposed to its immediate surrounds which will provide better shelter.

The methodology to be used is as follows:

1. All work is to be undertaken during weather suitable for lizard activity (≥14 deg C and after 10 am in the morning), and at least four weeks prior to any permanent vegetation clearance.
2. Area that is to be subject to vegetation clearance is to be clear marked on site.
3. Vegetation is to be progressively trimmed in 20 cm increments down to a height of ~40 cm using a scrub cutter with line trimmer attached. It is important that this is done progressively (in small increments) so that skinks are likely to leave the area due to the disturbance and thus not be injured by the scrub cutter.
4. Once the initial vegetation has dried out (approximately 1 week later) the area is to be trimmed again using a circular metal blade to reduce the vegetation height further, to approximately 20 cm.
5. Alternative scrub cutting methodologies may be used if they are found to be more practical or efficient (in consultation with the Project Herpetologist). No mulching or mowing shall be undertaken to achieve the same outcome (these methods are more likely to have an adverse impact on any lizards present).
6. Additional passes with the scrub cutter may be needed if there is a time lag and vegetation regrows prior to permanent disturbance.

4.4.3 Lizard Activity

Any construction or clearance activity within the earthworks footprint where lizards are expected to be present (as mapped in yellow in **Figure 4**) shall only be undertaken in conditions that are suitable for lizard activity (>14 deg C). The purpose of this is to reduce injury and death of some individuals by providing an opportunity for them to move away from the disturbance wherever possible.

4.4.4 Fallback Option

Prior to, or during, construction it may become apparent the matters detailed in Sections 4.4.2 and 4.4.3 are impractical or too restrictive. If this is the case, additional compensation will be added to override these requirements. This is detailed further in the compensation in Section 4.7.1.

4.5 Incidental Discovery Protocol

The Incidental Discovery Protocol (**Figure 5**) applies to any lizard discovered alive, dead, or injured within the LMP site. Any lizard sightings by NZSki staff, their contractors, or the public, prior to, or during, any works will be reported to the Project Herpetologist and the requirements of this LMP adhered to.

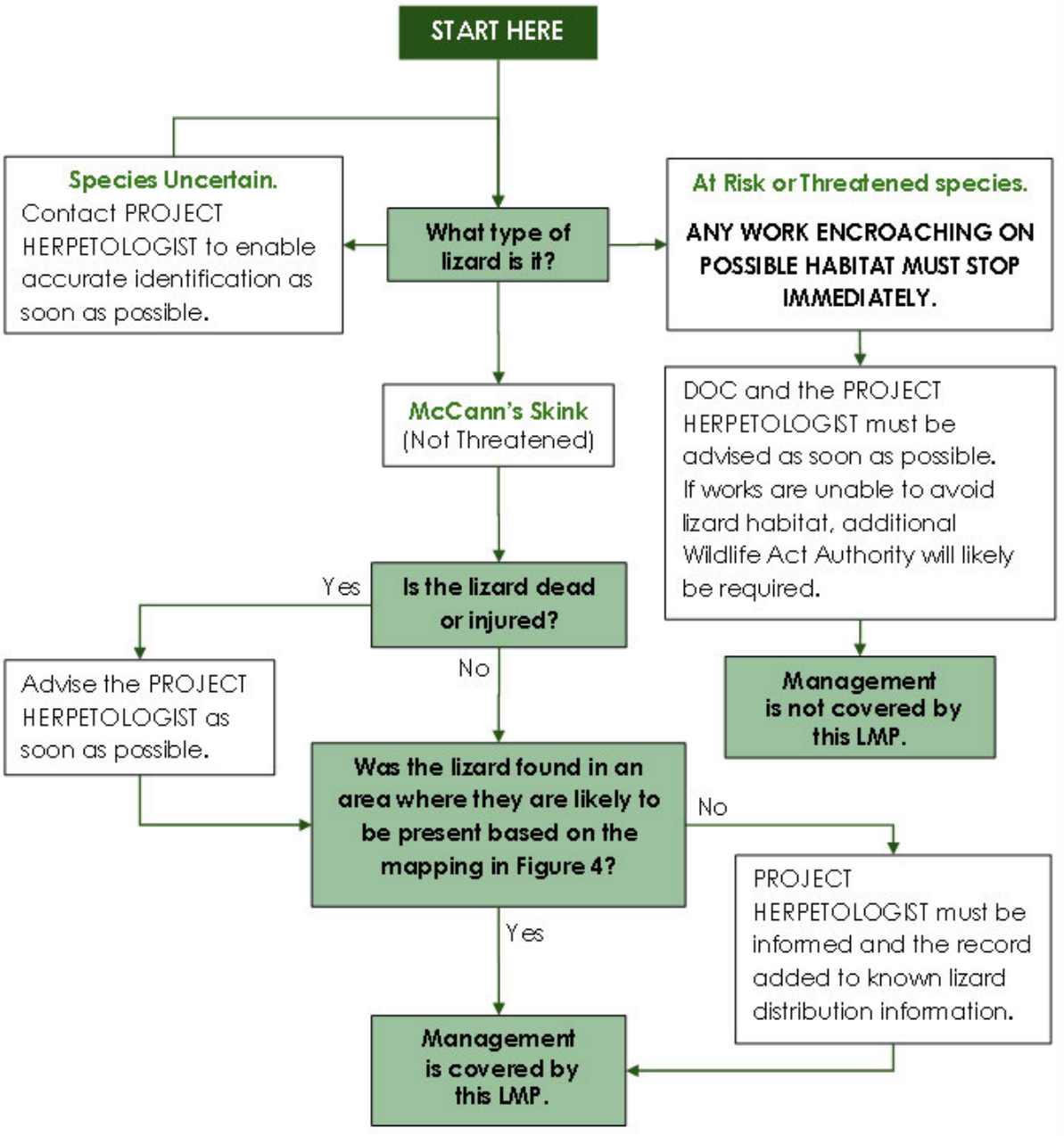


Figure 5: **Incidental Discovery Protocol**.

4.6 Contingency Mitigation

This section outlines the actions to be undertaken in the event of unanticipated lizard discoveries or adverse effects on lizards resulting from activities by NZSki. This LMP does not have triggers to require contingency mitigation due to the intent that it applies to Not Threatened species only. As per the Incidental Discovery Protocol (Section 4.5) any impacts on At Risk or Threatened species are not within the scope of this LMP. Residual effects following mitigation are captured by the compensation detailed in Section 4.7.1 below.

4.7 Residual Effects Assessment

There are significant residual effects from the activity that require compensation (including the injury and death of McCann's skinks - due to the lack of any salvage effort, or other possible management to ensure there is no net loss in the local skink population such as predator control. The compensation detailed below will address this, along with any other unidentified residual effects.

4.7.1 Compensation

The compensation proposed is a lizard specific research project. The details are described as follows.

RESEARCH PROJECT UTILISING eDNA TO DETECT THREATENED AND AT RISK LIZARDS IN THE REMARKABLES ECOLOGICAL DISTRICT

Background

Due to the low catch-per-unit-effort of alpine lizards such as orange-spotted gecko (Knox, et al., 2019) using traditional search techniques, there is a need to develop more efficient and reliable detection methods. This will enable a better understanding of the overall distribution and abundance of our cryptic alpine lizard species, thus greatly assisting in their conservation management.

Targeted field work is required to test new tools and techniques for detecting species, like orange-spotted gecko, with greater reliability and / or efficiency (compared to spotlighting or rock-lifting). One such tool that could be tested is using Environmental

DNA (eDNA), which has already proved effective with skinks at lower elevation sites in New Zealand (Reeves, et al., 2025); Cassie Mealey, DOC pers. comm.). For example, trials have shown eDNA detection rates for Otago skink (*Oligosoma otagense*) are 30–50% higher than traditional field methods (Reeves *et al*. 2025). These results provide confidence this method will detect cryptic species in alpine habitats, including species possibly missed in prior survey. Environmental DNA can detect species and measure community diversity at diverse spatio-temporal scales, and is especially useful for detection of elusive, cryptic, or rare species, making it potentially very valuable in herpetology (Nordstrom, et al., 2022).

2. Scope

The project shall target the following species:

- Orange-spotted gecko (*Mokopirirakau* "Roys Peak"): Threatened – Nationally Vulnerable.
- Lakes skink (*Oligosoma* aff. *chloronoton* "West Otago"): Threatened – Nationally Vulnerable.
- Central - Southern skink (*Oligosoma* aff. *inconspicuum* "Central – Southern"): At Risk - Declining.
- Short-toed gecko (*Woodworthia* "southern mini"): At Risk – Declining.
- Nevis skink (*Oligosoma toka*)*:* At Risk – Declining.

Both eDNA technology and manual habitat survey will be used to search for new Threatened and At Risk lizard populations in the Remarkables Ecological District, and the methods will be directly compared. The project shall include two known locations of orange-spotted gecko in the Hector Mountains plus an additional eight locations in suitable habitat elsewhere in the Ecological District. Four of the locations will be in the Rastus Burn and Doolans catchments within, or near, ski field activities.

Environmental DNA sampling is yet to be applied to alpine lizards making such research exciting and highly novel. A lot of New Zealand's most threatened lizard species occur in the alpine zone of the South Island and are difficult to detect using traditional survey techniques. Thus, such research would be of high relevance to the detection (enabling subsequent conservation) of rare alpine lizard species or populations. Adequate funding would be required to enable processing of samples.

3. Quantification

The quantum to be provided by NZSki to support this research will be a minimum of $80,000 (ex GST). If the mitigation detailed in Sections 4.4.2 and 4.4.3, regarding removal of vegetation cover and ceasing construction in temperatures below 14 deg C are not complied with, then an additional $20,000 (ex GST) will be added to this compensation package.

4. Methods

The research project will include the following actions:

1) Use of GIS mapping to identify possible orange-spotted gecko habitat in the Remarkable Ecological District at 10 sites.
2) Using tracking tunnels to collect eDNA samples from the 10 sites (these get placed around the edges of, or within cavities amongst, boulderfield and left at site for approximately two weeks before collection). Two known orange-spotted gecko populations will be included in the project to confirm that the technique can detect geckos as expected. If the technique proves successful at known sites it will then be expanded to potential sites where it is uncertain whether the species is present.
3) eDNA data will be analysed by Wilderlab NZ.
4) Manual habitat searching (including rock-lifting and/or spotlighting) will be undertaken at the survey sites whilst deploying and collecting tracking tunnels. This will allow comparison of the two survey methods.

5. Resourcing

It is anticipated that the research will be undertaken by a research student as an MSc or PhD project via the University of Otago's Zoology Department but would also need supervision and assistance from a Suitably Qualified Ecological Herpetologist.

6. Reporting

The results will be documented in both a thesis and one or more manuscripts in the peer-reviewed scientific literature. This will enable the learnings to be easily available to, and applied by, other ecologists both in NZ and overseas.

7. Timeline

The fieldwork will be completed over summer months when the weather is suitable for lizard activity. The fieldwork will be completed within 18 months of consent being granted. Reporting shall be completed within 12 months of fieldwork being completed.

8. Contingency Plan

If a student has not committed to the project within 12 months of consent being issued, the timeframes for completion may be extended by 12 months.

If, after 18 months of consent being issued, a student to undertake the research has still not been found (and timely attempts to do this are documented through emails with herpetologists and University staff) then an alternative use of the funding shall be proposed by a Suitably Qualified Herpetologist and agreed with the Department of Conservation. Any alternative proposal must be focussed on conservation of Threatened and At Risk lizards in the Remarkables Ecological District and be completed within five years of consent being issued.

5 Reporting

An annual Lizard Management Report will be prepared and submitted to the Department of Conservation by June 30 every year. This report will document all actions undertaken, including documentation of habitat disturbance minimisation measures, any incidental lizard discoveries, and the compensation package actions. It will be accompanied by supporting materials such as maps, photographs and GPS data.

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Appendix 1: Fast Track Approvals Act Schedule 7: Approvals Relating to Wildlife.

This application seeks Wildlife Act approval to disturb, injury and/or kill the Not Threatened McCann's skink within the earthwork's footprint. Efforts have been and will be made to reduce this via avoidance and mitigation via implementation of consent conditions. This section addresses the information required for an application for wildlife approval as set out in Schedule 7, clause 2(1) of the FTAA.

The purpose of the proposed activities (clause 2(1)(a))

The purpose of the Project is to upgrade the existing infrastructure within the Remarkables Ski Area and expand the skiable terrain available through an expansion into the adjacent Doolans Basin. The Doolans Basin will be accessed via a newly established gondola and ski trails. Section 1.2 of this report provides further detail regarding the project.

The proposed activities and their location (clause 2(1)(b) and (h))

NZSki is applying for wildlife approvals to injure and kill McCann's skink within the earthwork's footprint, and disturb lizards located nearby. The location of the proposed works is within Public Conservation Land and is presented in **Figure 1** of this report. The locations where this footprint intersects with likely lizard habitat is detailed in **Figure 4** representing the area where mitigation and compensation actions are needed. NZSki are not applying to hold any protected species as the proposal is for no salvage to occur (see Section 4.4.1).

Assessment against the purpose of the Wildlife Act (clause 2(1)(c))

The purpose of the Wildlife Act includes the protection of wildlife. The Wildlife Act protects animals classed as wildlife and controls how people interact with wildlife. The application is relevant to the Wildlife Act because it proposes vegetation removal activities that provide habitat to protected wildlife species, and these species are likely be killed or injured. This activity specifically relates to McCann's skink (*Oligosoma maccanni*), as there is high certainty that At Risk or Threatened lizards are not present due to the survey effort that has occurred (Section 3).

The numbers of wildlife potentially impacted and the nature of the potential impacts/effects (clause 2(1)(d) and (e)).The only lizard species likely to be present in the area are McCann's skink (*Oligosoma maccanni*) that are classified as Not Threatened, and it is estimated that 300-600 will be impacted (see Section 3.1).

Methods to ensure best practice standards and to ensure safe, efficient and humane treatment (clause 2(1)(f) and (g))

Section 4 of this report identifies effects management to avoid, remedy, mitigate, and compensate for the impacts on McCann's skink.

Temporary holding of wildlife (clause 2(1)(i))

No wildlife is proposed to be temporarily held or relocated as part of this activity. The compensatory actions detailed in Section 4.7.1 would be undertaken by a Suitably Qualified and Experienced Herpetologist with the separate and necessary authority to conduct the activity.

Nature and impact of the potential effects (clause 2(1)(j) and (k))

The Assessment of Effects is detailed in Section 3 of this report. The effects management is detailed in Section 4. This identifies and describes management to avoid, remedy, mitigate, and compensate for the impacts on McCann's skink. There are residual effects and these are described in the compensation outlined in Section 4.7.1.

Persons involved in any conviction of any offence under the Wildlife Act 1953 (clause 2(1)(l) and (m))

No persons in e3Scientifc, or their contractors, have been involved in any conviction under the Wildlife Act 1953, nor has any conviction pending before the court.

Details of consultation, including with hapū or iwi, on the application specific to wildlife impacts (clause 2(1)(n))

e3Scientific are not aware of any consultation has been undertaken relating to wildlife.

Details of any additional written expert views, advice, or opinions (clause 2(1)(o))

There are no additional written expert opinions in relation to this proposal. Dr Mandy Tocher provided input and feedback on earlier versions of the document prior to the scope being considerably changed and reduced.

Appendix 2: Lizard Habitats/Vegetation Communities of the LMP site.

The vegetation descriptions are detailed in full in (e3Scientific, 2026c). Parts of this document have been copied here for convenience.

Snow Tussock Grassland (AL1)

Tussock grassland is the dominant vegetation community present throughout the study area and wider Remarkables Ecological District at similar altitudes (see Figure 21 and Plate 2). *Chionochloa macra* is the dominant species above approximately 1600 m asl, with *Chionochloa rigida* becoming the more prevalent species below this elevation, with lesser amounts of *Poa colensoi* throughout all elevations. The inter-tussock community consists of a range of herbs and grasses including *Celmisia haastii, Dracophyllum muscoides, Epilobium alsinoides, Gautheria depressa, Raoulia grandiflora* and *Viola cunninghamii.* Greater than 99 % of the overall vegetation cover within this community consists of indigenous species, with isolated areas of bare ground, rock, exotic herbs and grasses. It is noted that in areas of *Chionochloa rigida*, inter-tussock species abundance is considerably lower as a result of increased tussock litter.

Twenty-one Regionally/Nationally At Risk or Data Deficient species were recorded within the surveyed area or within previous studies completed within this community.

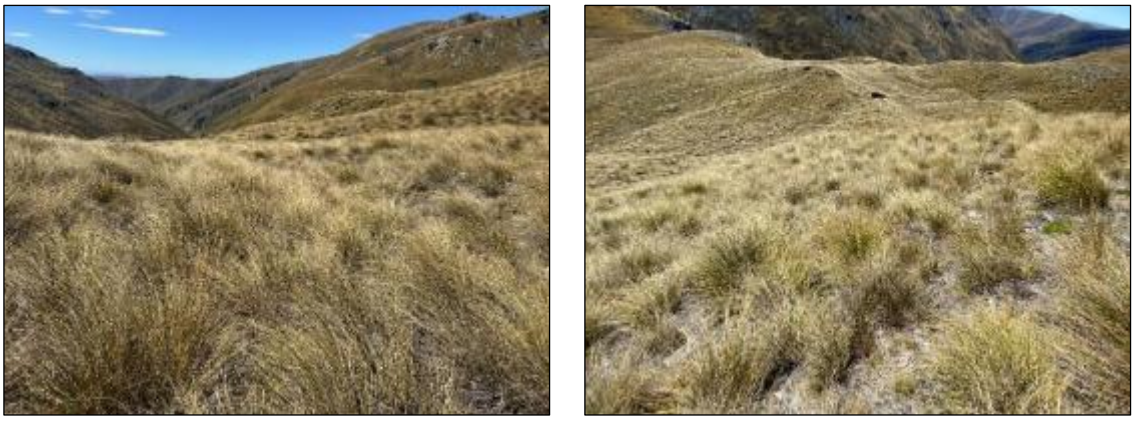


Plate 2: Photographs of snow tussock grassland.

North Facing Tussock Grassland (AL1)

The north facing tussock grassland community is similar to the snow tussock grassland community, also being dominated by Chionochloa macra. However, due to factors such as increased solar exposure, slope, and wind induced evapotranspiration, the areas on north facing slopes tend to exhibit lower species diversity, with a higher abundance of drought tolerant native herbs and grasses. In these areas, snow tussock cover drops to approximately 50-80 % of the total vegetation cover with Poa colensoi, Rytidosperma pumilum, Raoulia grandiflora, and Viola cunninghamii becoming more prevalent.

Plate 3: Photographs of north facing tussock grassland vegetation community.

Eight Regionally/Nationally At Risk or Data Deficient species were recorded within the surveyed area or within previous studies completed within this community.

Dracophyllum Scrub (VS7)

Dracophyllum is highly characteristic of the montane to subalpine zone associated with the Ecological district, becoming increasingly prevalent below approximately 1400 m asl. *Dracophyllum rosmarinifolium* almost independently dominates the shrubland vegetation strata with scattered occurrences of *Chionochloa rigida* also being present. Due to the nutrient poor characteristics of where this community occurs and heavy organic litter production species diversity within the community is notably low. Commonly observed indigenous prostrate species include Muehlenbeckia axillaris, *Poa colensoi, Gaultheria depressa var. novae-zealandiae, Austroblechnum penna-marina subsp. alpina, Raoulia subsericea,* and *Austrolycopodium fastigiatum*. However, individually account for less than 1% of the overall vegetation cover.

No At Risk or Threatened species were observed or recorded during survey efforts or within previous studies undertaken in this community.

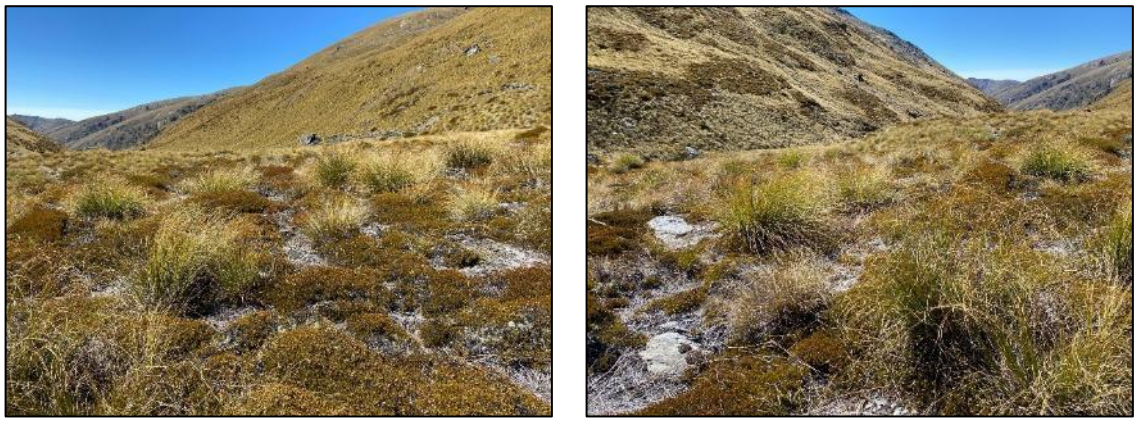


Plate 4: Photographs of *Dracophyllum* scrub vegetation community.

Cushionfield

Cushionfield communities are scattered across the study area, becoming extensively prevalent along exposed ridges and knolls and alpine locations prone to drought or higher snowfall (see Figure 21 above and Plate 5). These communities have developed in response to high wind and sun exposure with relatively stoney substrate, and shallow soil depths. The dominant species throughout this vegetation community are *Dracophyllum muscoides* with indigenous herbs, grasses and rushes including *Poa colensoi, Raoulia grandiflora, Luzula pumila, Abrotanella inconspicua, Rytidosperma pumilum, Leptinella goyenii, Hectorella caespitosa* and *Anisotome imbricata* common throughout.

Twenty-two Regionally/Nationally At Risk were recorded within the surveyed area or within previous studies completed within this.

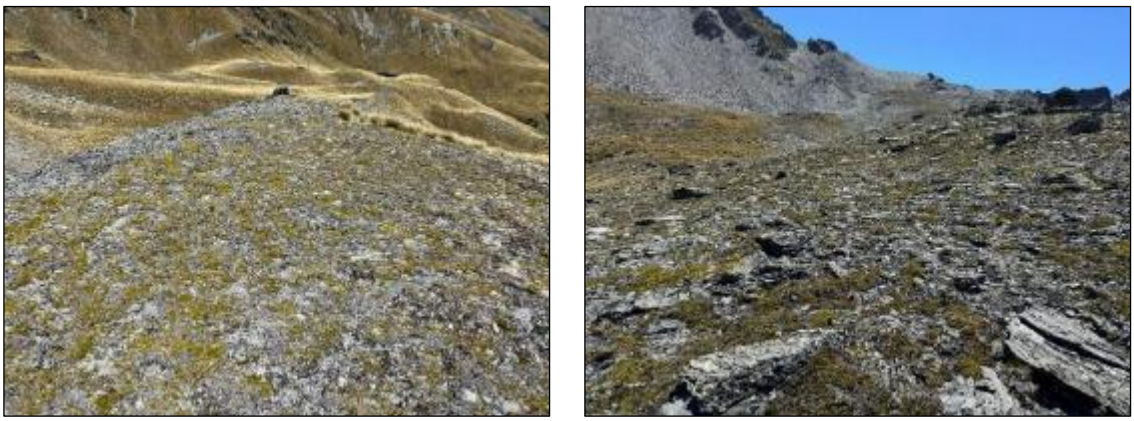


Plate 5: Photographs of cushionfield vegetation community.

High Alpine Cushionfield (AH2)

A variation of the cushionfield community occurs across the high alpine areas within the study area (see Figure 21 above and Plate 6), which are exposed to frost heave, snow accumulation and/or a high level of evapotranspiration. Within this community are micro sites of fellfield and snowbank forming across the variable gradients in substrate and climactic conditions. Key species throughout this vegetation community include *Phyllachne rubra, Carex pyrenaica* var. *cephalotes,* and *Raoulia aff. bryoides* with lesser amounts of *Dracophyllum muscoides, Poa colensoi, Raoulia grandiflora, Luzula pumila, Abrotanella inconspicua, Leptinella goyenii, Kellaria childii, Hectorella caespitosa* and *Anisotome imbricata* also present.

Twelve Regionally/Nationally At Risk species were recorded within the surveyed area or within previous studies completed within this community.

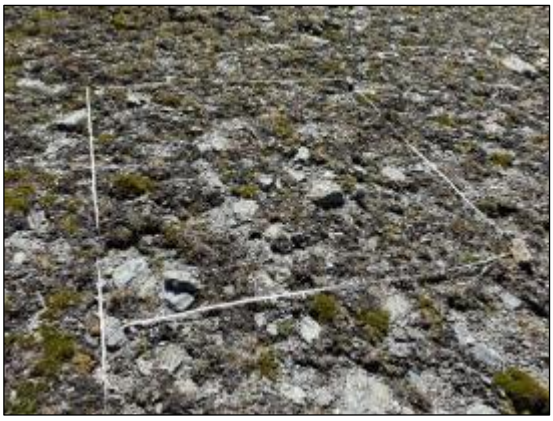



Plate 6: Photographs of cushionfield vegetation community.

Cushion Bog (WL9)

The lower faces of the Doolan's Basin are covered in numerous interconnected cushion bog, riparian and seepage wetlands. Cushion bogs are present on relatively level or gently sloping ground within hill crests, basins, terraces, and adjacent to other wetland types. Enclosed within are small formations of string mire. The soils are predominantly peat and have high water tables, often exhibiting extensive areas of standing water. *Oreobolus pectinatus* is the most prevalent species throughout the cushion bog communities, with *Carex gaudichaudiana, Caltha obtusa* and *Abrotonella inconspicua* also abundant throughout.

Twenty Regionally/Nationally At Risk and three Threatened species were recorded within the surveyed area or within previous studies completed within this community.


Plate 7: Photographs of Cushion bog vegetation community.

Riparian Wetland (WL9)

Riparian wetlands are present along the edges of streams throughout the Doolans catchment (see Figure 21 above and Plate 8) and are characterized by being wet or saturated for at least part of the year; often occurring in association with ephemeral or intermittent creeks. *Oreobolus pectinatus* and *Schoenus pauciflorus* are the most dominant species with *Acaena saccaticupula, Caltha obtusa, Celmisia alpina, Celmisia sessiliflora, Centrolepis pallida, Coprosma perpusilla* subsp. *perpusilla, Craspedia lanata* var. *lanata, Euchiton lateralis, Poa colensoi* and *Viola cunninghamii common throughout.*

Eighteen Regionally/Nationally At Risk and four threatened species were recorded within the surveyed area or within previous studies completed within this community.

Plate 8: Photographs of riparian wetland vegetation community.

Seepage (WL17)

Seepage wetlands are present throughout the lower faces of the Doolans Basin (see Figure 21 above and Plate 9); occurring where groundwater emerges on hillsides or at the edge of slopes as a result of upwelling or subsurface geomorphological patterns. Throughout the study area seepages drain to or from other wetland classes connecting the large freshwater features. The most dominant species present throughout this vegetation community include *Schoenus pauciflorus. Oreobolus pectinatus,* and *Caltha obtusa.* A wide range of other indigenous herbs and grasses are common throughout seepage wetlands throughout the study area, however, generally occurring in lower abundance.

Twenty eight Regionally/Nationally At Risk or Data deficient, and five Threatened species were recorded within the surveyed area or within previous studies completed within this community.


Plate 9: Photographs of seepage vegetation community.

Rockfield (AH2)

Rockfield communities are prevalent across the study area, particularly in the upper elevations of the study area where the ridgeline drops into the Doolans and Rastus Burn catchments (see Figure 21 above and Plate 10). The rockfield areas have steep slopes prone to movement of the rock substrates, within avalanche prone areas, thus lacking suitable conditions for rapid vegetative stabilisation. Therefore, a significant proportion of these areas do not contain any vegetation. Where vegetation is present it is scattered, commonly accounting for less than 25 % of the total cover. Species commonly noted throughout this vegetation type include *Chionochloa macra, Epilobium tasmanicum, Hectorella caespitosa, Poa colensoi* and *Raoulia grandiflora*. Isolated areas occur as a subset of this community at lower elevations (below 1600 m asl) constituting deep seated rocky rubble/boulders with indigenous sprawling species (*Coprosma perpusilla* subsp. *perpusilla, Melicytus alpinus, Myrsine nummularia,* and *Pimelia notia*).

Six Regionally/Nationally At Risk species were recorded within the surveyed area or within previous studies completed within this community.

Plate 10: Photographs of rockfield vegetation community.

Rocky outcrop (AH2)

Rocky outcrop plant communities are present in small pockets across the landscape (see Figure 21 above and Plate 11). They occur in areas where bedrock is exposed at or near the surface. These communities are defined by their harsh conditions including limited soil accumulation, nutrient poor environments, and exposure to the elements. As a result of these conditions, vegetation within rocky outcrop communities tends to be sparse and patchy. Prevalent species across these areas include *Poa colensoi, Luzula pumila, Leptinella goyenii, Veronica thompsonii, Hectorella caespitosa, Koelaria cheesemanii, Colobanthus buchananii*, *Epilobium porphyrium* and *Agrostis muelleriana.*

Plate 11: Photographs of rocky outcrop vegetation community.

Twenty-three Regionally/Nationally At Risk and one Threatened species were recorded within the surveyed area or within previous studies completed within this community.

Snowbank (AH2)

Three small areas of snowbank community were noted within the study area in high alpine areas which hold snow cover for up to seven months of the year (see Figure 21 and Plate 12). *Carex pyrenaica* var. *cephalotes, Dracophyllum muscoides, Kelleria childii* and *Poa colensoi* are prevalent species found within snowbank communities across the study area, alongside a range of other indigenous herbs and grasses.

Nine Regionally/Nationally At Risk species were recorded within the surveyed area or within previous studies completed within this community.

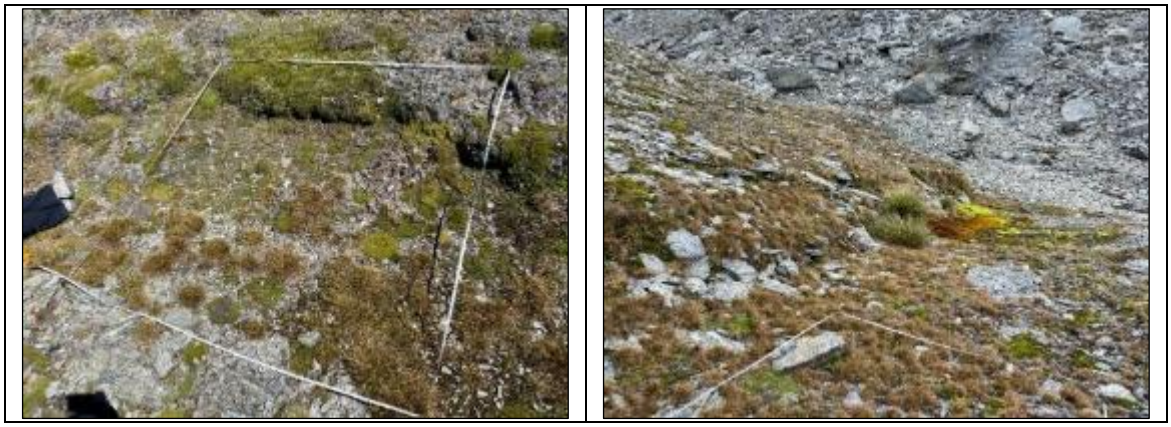


Plate 12: Photographs of snowbank vegetation community.

Disturbed Vegetation

Areas of disturbed vegetation are limited to within the current ski area boundary in the Rastus Burn Basin (see Figure 21). Disturbed vegetation communities exist where ski trails, roads, carparks etc., have been developed. Bare ground is prevalent throughout this vegetation community, as well as scattered early colonising indigenous species and exotic grasses and herbs (see Plate 13). Commonly observed species include, *Acaena saccaticupula, Agrostis muelleriana, Chionochloa macra, Colobanthus buchananii, Luzula pumila, Poa colensoi, Raoulia grandiflora, Raoulia subsericea, Raoulia tenuicaulis, Rytidosperma pumilum,* and *Scleranthus uniflorus.*

Six Regionally/Nationally At Risk or Data Deficient species were recorded within the surveyed study area.

Plate 13: Photographs of disturbed vegetation community.

Appendix 3: Summary of Survey Effort (Hours) And Weather Conditions at Remarkables Ski Area (And Doolan's Expansion) During the January-March 2025 and January-February 2026 Lizard Survey.

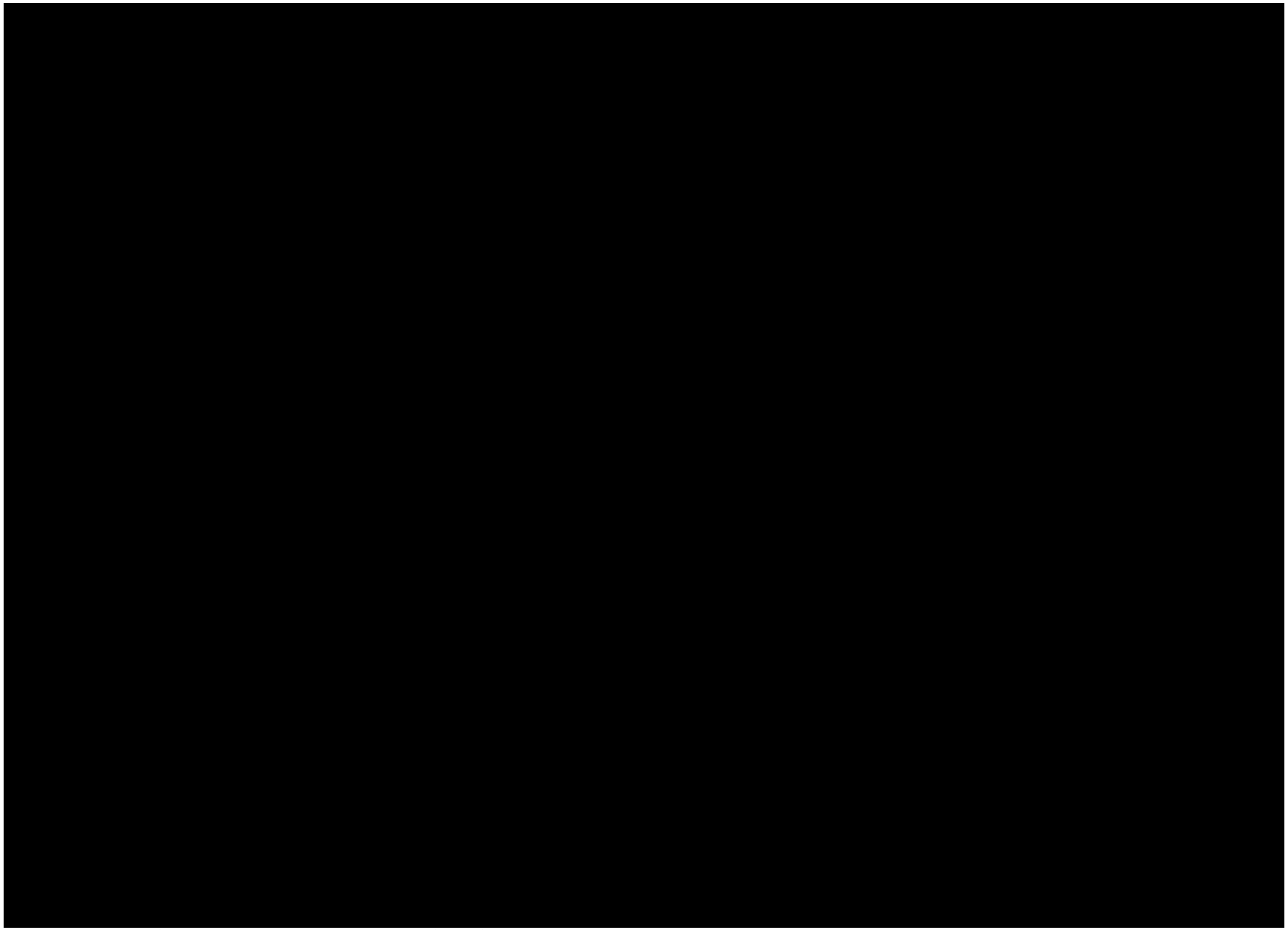
Date/Round	Weather	Activity and Effort	Rastus Burn Basin	Doolans Basin
30 January - 7 February 2025	Fine with warm temperatures over this period.	• Manual habitat searching while completing vegetation surveys: 10 hours.	X	X
12-17 February 2025 (Round 1)	12/02/25: Fine, light winds, warm temps light drizzle 13/02/25: Fine, light winds, warm temps light drizzle 14/02/25: Fine light winds, warm temps 15/02/25: Fine light winds, warm temps 16/02/25: Fine light winds, warm temps 17/02/25: Fine, light winds, warm temps	• Trapping: 200 g-minnow traps. 5 trap nights per trap. • Manual habitat searching: 6 hours (1 hour/day).		X
26 February - 2 March 2025 (Round 2)	26/02/25: Fine, light winds, warm temps 27/02/25: Fine, light winds, warm temps 28/02/25: Fine, light winds, warm temps 01/03/25: Cloudy, light winds, gusts up to 40km/h 02/03/25: Cloudy, moderate winds, light afternoon rain	• Trapping: 200 g-minnow traps. 4 trap nights per trap. • Manual habitat searching: 5 hours (1 hour/day).	X	X
9-15 March 2025 (Round 3)	09/03/25: Fine, partly cloudy, moderate winds 10/3/25: Fine, partly cloudy, moderate winds 12/03/25: Snow on ground, cloudy 13/03/25: Fine, light winds, moderate temps 14/03/25: Fine, light winds, moderate temps 15/03/25: Fine, light winds, moderate temps	• Trapping: 200 g-minnow traps 5 trap nights per trap. • Manual habitat searching: 6 hours (1 hour/day).	X	X
15-22 March 2025 (Round 4)	15/03/25: Fine, light winds, moderate temps 16/03/25: Fine, light winds, moderate temps 20/03/25: Fine, light winds, moderate temps 21/03/25: Fine, light winds warm temps 22/03/25: Fine, light winds, warm temps	• Trapping: 200 g-minnow traps 5 trap nights per trap. • Manual habitat searching: 5 hours (1 hour/day).	X	
24-31 March 2025 (Round 5)	24/03/25: Fine, light winds, warm temps 25/03/25: Fine, light winds, moderate temps 26/03/25: Fine, light winds, moderate/low temps 29/03/25: Fine, light winds, moderate/low temps 30/03/25: Fine, light winds, moderate/low temps 31/03/25: Fine, light winds, moderate/low temps	• Trapping: 200 g-minnow traps. 4 trap nights per trap • Manual habitat searching: 6 hours (1 hour/day Temperatures during 29-31 March were cooler than expected and were not forecast to improve. Survey was not completed. There is low confidence that results reflect lizard activity in suitable conditions (**Appendix 4**).	X	

27 January – 1 February 2026 (Round 6)	27/01/26: Fine, light winds with moderate NW gusts in the evening, moderate/warm temps (3-18+◦C) 28/01/26: Fine, light winds with moderate NW gusts, moderate/warm temps (3-18+◦C) 29/01/26: Fine, light winds with moderate NW gusts in the evening, moderate/warm temps (3-18+◦C) 30/01/26: Fine, light winds with moderate SW gusts in the morning, moderate/warm temps (4-20◦C) 31/01/26: Fine, light winds with moderate NW gusts in the evening, moderate/warm temps (4-20+◦C) 01/02/26: morning low cloud clearing to fine, light winds, moderate /warm temps (6-20+ ◦C)	• Trapping: 130 g-minnow traps 4 traps nights per trap • Trapping: 70 g-minnow traps 5 traps nights per trap • Manual habitat searching: 6 hours (1 hour/day) plus 3 hours dedicated on 1 day.		X
Total		• 5470 g-minnow trap nights across 60 locations. • 41people hours Manual habitat searching.		

Appendix 4: Round 5 Trapping Result Implications.

The Round 5 lizard survey could not be completed due to the onset of cold weather, affecting results from ten trap sites (1, 2, 3, 4, 5, 7, 8, 13, 16, 20). Sites located below the Remarkables Ski Area base building (sites 1, 2, 3, 4, 5) contain potentially suitable lizard habitat; for example, Site 5 is north-facing and captured two lizards on the first trap night, but none thereafter (**Appendix 6**). Survey effort at these sites is therefore considered incomplete.

In contrast, the partially trapped sites above the base building (sites 7, 8, 13, 16, 20) were colder, lacked suitable habitat, and produced no detections during trapping or manual habitat searching. Further comprehensive survey at these locations is not considered necessary.



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