

**LIZARD ASSESSMENT AT SHADOW BASIN,
REMARKABLES SKI FIELD**



 providing
outstanding
ecological
services to
sustain
and improve our
environments



LIZARD ASSESSMENT AT SHADOW BASIN, REMARKABLES SKI FIELD

Contract Report No. 6175

November 2022

Project Team:

Samantha King – Report author

Prepared for:

NZ Ski Limited
The Remarkables Ski Area
Queenstown



CONTENTS

1.	INTRODUCTION	1
2.	METHODS	1
	2.1 Site location	1
	2.2 Lizard species potentially present	3
	2.3 Survey methods	3
3.	RESULTS	4
4.	CONCLUSIONS	5
	ACKNOWLEDGMENTS	6
	REFERENCES	6

Reviewed and approved for release by:



South Island Regional Manager/Principal Ecologist
Wildland Consultants Ltd

© *Wildland Consultants Ltd* 2022

This report has been produced by Wildland Consultants Ltd for NZ Ski Limited. All copyright in this report is the property of Wildland Consultants Ltd and any unauthorised publication, reproduction, or adaptation of this report is a breach of that copyright.

1. INTRODUCTION

The Remarkables Ski Area (ski field) is located in the Remarkables Range, near Queenstown. NZ Ski Ltd owns and operates the ski field and are applying for consent to replace and move the existing Shadow Basin Chairlift, and provide access tracks. The proposed development is a *c.* 800 metre chairlift along with benched access tracks connecting the NZ Ski facilities located at the Remarkables Ski Area. However, the benching of access tracks will be up to 30 metres, to allow for spoil and excavator movements. The chairlift will require the installation of 11 new towers and the development of a chairlift building.

The location of the proposed development is on Crown-owned land administered by the Department of Conservation. Information on species, abundance, and distribution of indigenous lizards (if found to be present) along the proposed chairlift and access track alignment is required to assess whether the instalment of the chairlift and access tracks will require lizard management in order to avoid or reduce potentially adverse effects that occur as a result of the proposed activity.

Wildland Consultants was commissioned to undertake an assessment for lizards along the proposed chairlift and access way alignment in order to improve knowledge of any lizard assemblages that may be present. This baseline information on the presence of lizard populations will help to guide any future survey, monitoring, or management actions. This report outlines the methods and results of the survey and provides suggestions for lizard management that may arise as result of the instalment of the new chairlift.

2. METHODS

2.1 Site location

An 975.6-metre section of the proposed chairlift and access way was surveyed for lizards. Elevation ranges from 1,612 metres above sea level (ASL) to 2,000 metres ASL at the top, on a dry northeast facing slope. The terrain is steep and covered in snow for at least four months of the year. Habitat consists of mainly exposed rock, loose rock shards, scree, cushion field and patches of indigenous tussockland (Plate 1).

The exact location of the Shadow Basin Chairlift has not yet been formally identified. Therefore, the site was assessed at a wider scale to determine any lizard habitats nearby the roughly identified tower locations.

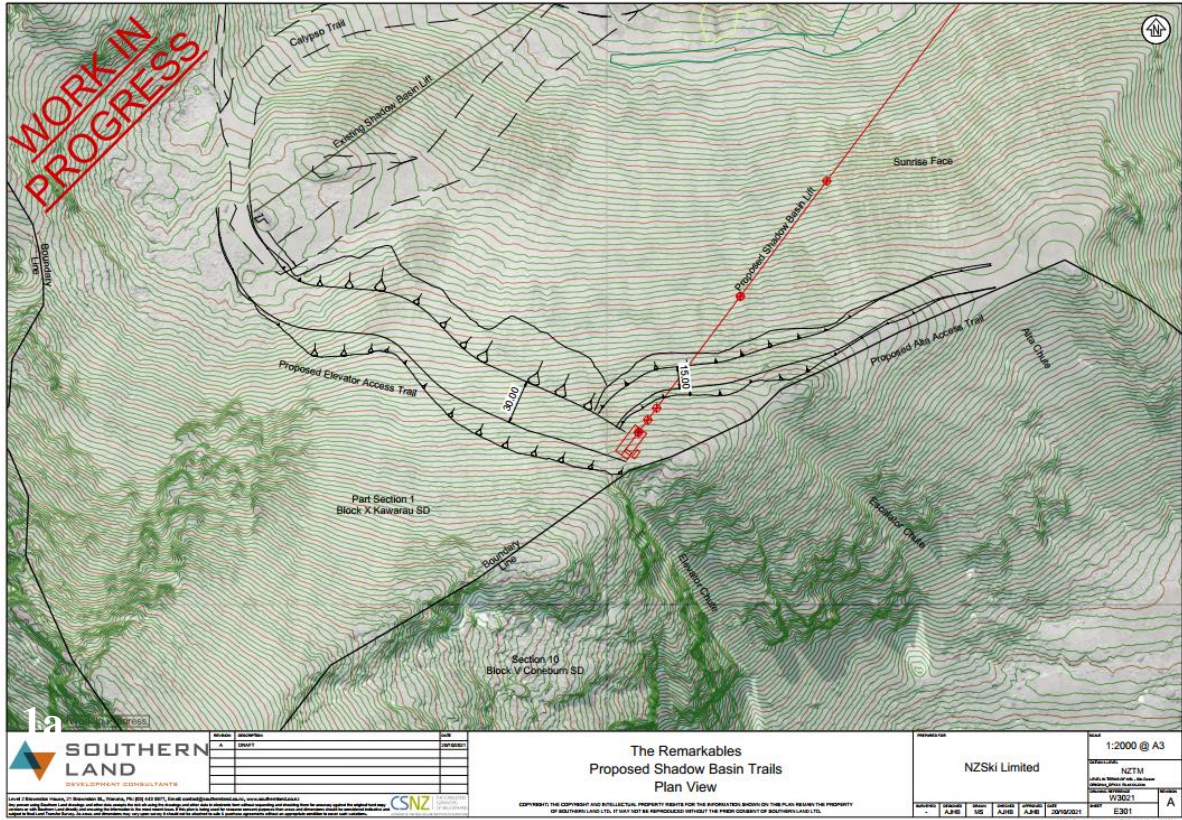


Figure 1: Proposed alignment of the Shadow Basin chairlift and Chushion Access.
 Figure by Southern Land Ltd, provided by NZSki.



Plate 1: Rock jumble lizard habitat along the proposed Shadow Basin chairlift and ski access at Cushion Trail. Photograph: S. King. 15 December 2021.

2.2 Lizard species potentially present

An earlier desktop assessment for lizards in the Remarkables was undertaken prior to the field assessment. This was to identify the lizard species that may be present, and understand their conservation threat status, habitat requirements, and known wider distribution (Wildlands 2019). The lizard desktop assessment identified three potential lizard species that may be present in the Remarkables (Table 1). All three lizard species have been reported from the Remarkables in recent years on other surveys.

Table 1: Three lizard species known from the Remarkables mountain range, near Queenstown. Some information derived from van Winkel *et al.* (2018) and Jewell (2006). Threat status as per Hitchmough *et al.* (2021).

Species	Threat status	Habitats of Interest	Distribution
McCann's skink (<i>Oligosoma maccanni</i>)	Not Threatened	Widespread in all habitats below 1,550 metres ASL. Likes rocky areas and tolerant of dry conditions.	Common throughout most of Otago, especially Central Otago.
Short-toed gecko (<i>Woodworthia</i> "Southern Mini")	At Risk - Declining	Rocky habitats including tors, screes, boulderfields, and loose rock aggregations. Nocturnal, hides in rocks by day. Has been found up to 1,680 metres ASL in the Humboldt Mountains, but has only been found up to 1,350 metres in the Remarkables.	Mountainous areas in western Otago and Southland.
Korero gecko (<i>Woodworthia</i> "Otago large")	At Risk- Declining	Rocky habitats up to ~1100 metres ASL including tors, screes, boulderfields, and loose rock aggregations. Nocturnal, hides in rocks by day.	Found throughout much of Otago and Southland.

The most likely species present within the works footprint are McCann's skink (*Oligosoma maccanni*) and short-toed gecko (*Woodworthia* "southern mini"). McCann's skink have been observed within boulderfield habitat at Lake Alta (Dr. Des Smith, pers. Comm) but are unlikely to be inhabiting elevations over 1,900 metres ASL. Korero geckos are unlikely to be present as they appear not to reach elevations over 1,100 metres ASL.

Other alpine lizard species from the Southern Lakes district include orange-spotted gecko (*Mokopirirakau* "Roy's Peak"), lakes skink (*Oligosoma* aff. *chloronoton* "West Otago"), cryptic skink (*Oligosoma inconspicuum*), Nevis skink (*Oligosoma toka*), and southern grass skink (*Oligosoma polychroma* Clade 5). However, none of these species have ever been recorded in the Remarkables, despite extensive survey effort by herpetologists (C. Knox, unpubl. data). These species are therefore not considered further in this report.

2.3 Survey methods

A field survey for indigenous lizards was undertaken on 15 December 2021 in the proposed Shadow Basin at the Remarkables Ski Area. This survey effort consisted of five person hours (09:00-14:00) undertaken by a herpetologist. Weather conditions were sunny to overcast with light northerly winds and air temperatures ranged between 11°C and 13°C. Cloud cover was 3/4^{ths} of the visible sky.

The search involved traversing the length of the proposed Cushion Trail, elevator access and proposed Shadow Lift section. The survey started at the uppermost end of Cushion Trail (c. 2,000 metres ASL) and proceeded downhill to the lowermost end of the Shadow Lift at 1,612 metres ASL.

Searching consisted of a combination of visually scanning for basking, emergent, or foraging lizards present on rocks or amongst vegetation, and lifting rocks to look for lizards sheltering underneath. A hand-held torch was used to look into rock crevices for geckos (as well as for their shed-skins and droppings) throughout areas of boulderfield / rock jumble habitat.

3. RESULTS

No lizards were found along the proposed Shadow Basin and Cushion Trail. Lizard habitat was found throughout the site, however the elevation may not support high numbers of lizard and one survey cannot confidently confirm the absence of lizards from the Shadow Basin site.

One *Peripatus/ngaokeoke* was found at proposed Shadow Basin Chairlift Tower 8 (Plate 2). *Ngaokeoke* is significant as this is a poorly understood organism, of which twelve species have been formally described in New Zealand (Trewick *et al.* 2018). *Ngaokeoke* are infrequently encountered in the alpine zone and may not have been previously discovered at such an elevation. In addition, *Ngaokeoke* have not yet been formally recorded in the Remarkables Range (Department of Conservation, 2014).

The *ngaokeoke* observation location is recorded in Table 2.



Plate 2: Ngaokeoke/peripatus found at the Remarkables within the proposed Shadow Basin Chairlift upgrade footprint. Photograph: S. King. 15 December 2021.

Table 2: GPS locations (NZTM) of two observations during surveys at Remarkables Ski Field, including peripatus and McCann's skink.

Observation	Easting	Northing
Peripatus	1269942	5001957

4. CONCLUSIONS

Although the installation of the Shadow Basin Chairlift could be assessed as having a relatively low adverse impact on the lizard populations present (considering that no lizards or sign was found within the Shadow Basin area), all indigenous lizards (and therefore their habitats) are legally protected from disturbance or harm. Lizards are likely to be injured or killed during earthworks, as well as suffering habitat loss.

We recommend that an incidental encounter protocol for lizards is provided for the construction of the Shadow Basin Chairlift in the unlikely event that lizards are encountered during site works.

In addressing the adverse impacts on ngaokeoke, the possible management options include:

1. The avoidance of any ngaokeoke habitat (especially adjacent to Tower 8), along the proposed route by micro-siting Shadow Basin Tower sites to determine the position that may best avoid ngaokeoke habitat and still be functional.

2. Advice from an invertebrate specialist in ngaokeoke and any options that the Department of Conservation may be able to identify.

The Department of Conservation may make recommendations to NZSki to undertake Ngaokeoke management, by way of further surveys or rehabilitation of the proposed works.

Advice from the Department of Conservation is now required to progress the Shadow Basin Chairlift project beyond this initial report and its recommendations.

ACKNOWLEDGMENTS

Ross Lawrence (NZ Ski Ltd) is thanked for project liaison.

REFERENCES

- Department of Conservation. 2014. New Zealand peripatus / ngaokeoke; Current knowledge, conservation and future research needs. Department of Conservation, ōtepoti/Dunedin Office.
- Hitchmough, R.A.; Barr, B.; Knox, C.; Lettink, M.; Monks, J.M.; Patterson, G.B.; Reardon, J.T.; van Winkel, D.; Rolfe, J.; Michel, P. 2021: Conservation status of New Zealand reptiles, 2021. New Zealand Threat Classification Series 35. Department of Conservation, Wellington. 15 p
- Jewell T. 2006: Central Otago Lizards. Jewell Publications. 125 pp.
- van Winkel D., Baling M., and Hitchmough R. 2018: Reptiles and amphibians of New Zealand: a field guide. Auckland University Press. 366 pp.
- Trewick, S.; Hitchmough, R.; Rolfe, J.; Stringer, I. 2018: Conservation status of New Zealand Onychophora ('peripatus' or velvet worm), 2018. New Zealand Threat Classification Series 26. Department of Conservation, Wellington. 3 p.
- Wildland Consultants 2019: Indigenous lizard survey in relation to a proposed chair lift at the Remarkables ski field. Technical report prepared by Wildland Consultants for NZ Ski Ltd, May 2019. *Contract Report no. 4962*. 8 pp.



*Providing outstanding ecological services
to sustain and improve our environments*

Call Free 0508 WILDNZ
Ph: +64 7 343 9017
Fax: +64 7 3439018
ecology@wildlands.co.nz

99 Sala Street
PO Box 7137, Te Ngae
Rotorua 3042,
New Zealand

Regional Offices located in
Auckland, Hamilton, Tauranga,
Whakatane, Wellington,
Christchurch and Dunedin

ECOLOGY RESTORATION BIODIVERSITY SUSTAINABILITY

www.wildlands.co.nz