Lizard Management Plan for Southland Wind Farm

Contract Report No. 6656f

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Wildlands

Lizard Management Plan for Southland Wind Farm

Contract Report No. 6656f

August 2025

Project Team:	Prepared for:
Samantha King – Report author and fieldwork Cameron Thorp – Fieldwork Jade Christiansen – Fieldwork Sarah Budd – Technical review Nick Goldwater – Project lead, peer review	Contact Energy Ltd PO Box 10742, Kelburn, Wellington 6143

Reviewed and approved for release by:

[redacted]

Nick Goldwater
Senior Principal Ecologist
Wildland Consultants Ltd
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Christchurch Office
238 Annex Road, Middleton, PO Box 9276, Tower Junction, Ph 03 338-4005

Head Office
99 Sala Street, PO Box 7137, Te Ngae, Rotorua Ph 07-343-9017 Email: rotorua@wildlands.co.nz

www.wildlands.co.nz

Contents

1.0 Introduction

Contact Energy Ltd (Contact) engaged Wildland Consultants Ltd (Wildlands) to undertake preliminary lizard surveys and a habitat assessment at a proposed wind farm in Southland (the Project). The Wind Farm Site includes part of Jedburgh Station, Matariki (Venlaw) Forests, and part of Glencoe Station. The Project comprises up to 55 wind turbines and is located over an area of approximately 5,800 hectares (the Wind Farm Site – see Figure 1a, b, c).

Preliminary and targeted lizard surveys completed at the Wind Farm Site in 2023, 2024 and 2025 have detected two species of indigenous lizard; tussock skink (*Oligosoma chionocloescens;* At Risk - Declining), and Tautuku gecko (*Mokopirirakau* "southern forest"; At Risk - Declining). Although habitat for at least two other lizard species is also present within the Wind Farm Site, no other species have been detected to date.

This Lizard Management Plan (LMP) follows the principles outlined by the Department of Conservation (DOC) in its guidelines (DOC 2019) (Table 1). These principles describe the steps to enable the outcome of successful lizard management, including salvage. In accordance with these principles, this LMP has been informed by the following:

- A thorough assessment of the lizard values, and site significance, both at the site of impact and potential release sites; and
- An assessment of the actual and potential effects of the construction activities impact on the lizards present.

The objective of this LMP is to describe the measures to reduce potential effects of the Project on indigenous lizards in vegetation and habitats that will be impacted by the construction of the Project to meet the requirements of the consent conditions.

1.1 Wildlife Act 1953

Due to the presence of indigenous lizards within the Wind Farm Site, a wildlife approval for the proposed works is being sought under the Fast-track Approvals Act 2024 for the recommended salvage and relocation activities. This is broadly equivalent to a Wildlife Act Authority (WAA) under the Wildlife Act 1953 (Wildlife Act).

All indigenous lizards are protected under the Wildlife Act and a WAA must be obtained before any indigenous lizards can be disturbed (due to impacts from earthworks and vegetation clearance) or relocated. Lizard mitigation work will be undertaken by a DOC-approved ecologist who has been authorised to implement lizard management for the Project through a WAA issued for the Project.

A LMP (this document) is required to accompany the WAA application and must be approved prior to undertaking any activities that potentially impact on lizard populations, and any lizard management proposed to mitigate these effects.

1.2 Project site and context

Contact is proposing to construct and operate the Southland Wind Farm. Most of the Wind Farm Site spans Jedburgh Station (c.3,481 hectares) and Matariki Forests (*c*.2,737 hectares) on the Slopedown Range in Southland. There are also three wind turbines to be located on the adjoining Glencoe Station (*c*.1,448 hectares, Figure 1a, b, c).

In this LMP, the Southland Wind Farm Site is described as follows:

Wind Farm Site – Means the land upon which the wind turbines, wind farm substation and wind farm roads are located. This area is entirely in the Southland District and the Southland Region.

Project Site – Means the Wind Farm Site, plus the land also required for the grid connection works (i.e. the transmission line and the Grid Injection Point) and the main construction access route to the Wind Farm Site, through the Port Blakely Forest. This area is partly in the Southland District and partly within the Gore District, and entirely in the Southland Region.

1.3 Consent condition scope

The requirements of the consent conditions will be addressed through the implementation, monitoring and reporting procedures set out in this LMP and the interlinking plans outlined below.

The term '*vegetation clearance'* in this LMP refers to *all* vegetation clearance and habitat loss proposed to enable earthworks activities associated with the construction of the Southland wind farm and excludes the removal of all plantation forestry that is under Matariki Forests ownership and management. Further measures to address effects on lizards are detailed in the following plans:

- **The Vegetation Management Plan (VMP),** which provides detail on how adverse effects associated with vegetation clearance (including effects on lizard habitat) will be avoided or minimised through vegetation clearance protocols. This includes the felling and stockpiling of indigenous forest vegetation (gecko habitat) against adjacent remaining indigenous vegetation and the protocol for salvaged coarse wood to be relocated to enhance terrestrial habitats for lizards. (Note: the amount of vegetation that can be salvaged and relocated will be limited by vehicular access).
- **Habitat Restoration and Enhancement Management Plan (HREP),** which provides detail on the location, magnitude and type of indigenous habitat restoration and enhancement measures that are proposed to offset and/or compensate for significant residual effects on ecological values affected by the wind farm, including lizards.

contact

LEGEND

Wind Farm

- Wind Turbines
- Transmission Line Route
- Indicative Fill Disposal Sites
- Jedburgh Plateau
- Civil Works Design
- Wind Farm Site

Lizard Surveys

- Tussock Skink Recorded
- Artificial Cover Objects (Lizard ACOs)

MAP SCALE	PRINT DATE
N Scale: 1:20,000	15/08/2025
	VERSION 1.0

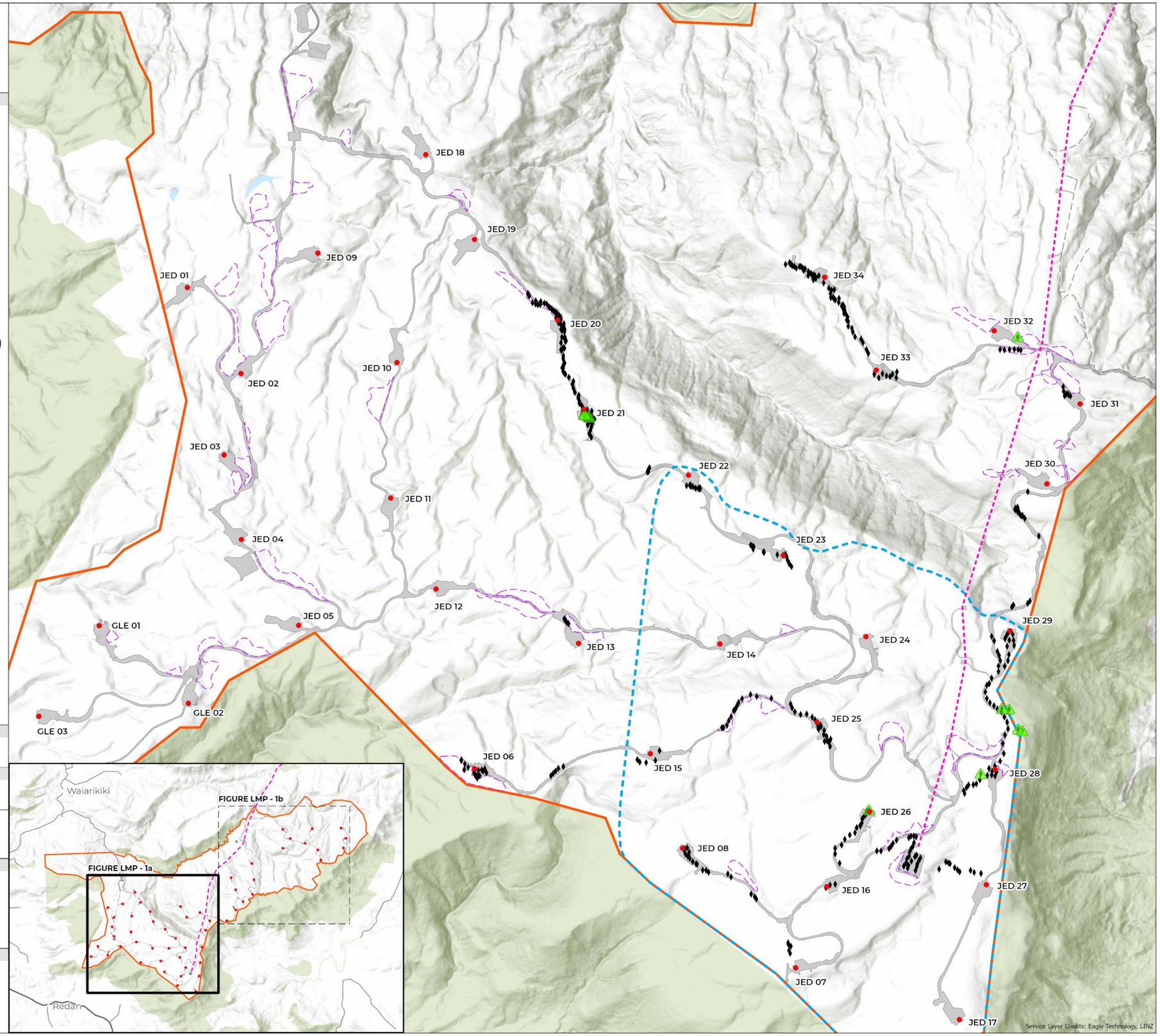
Kilometers
0 0.25 0.5 1

CREDITS:

Wildlands
Ecological data provided by Wildlands Consultants

TITLE

FIGURE LMP - 1a
LIZARD SURVEY LOCATIONS AND TUSSOCK SKINK RECORDINGS WIND FARM SITE - WEST



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LEGEND

Wind Farm
- Wind Turbines
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MAP SCALE	PRINT DATE
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	VERSION 1.0

Kilometers
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Ecological data provided by Wildlands Consultants

TITLE

FIGURE LMP - 1b
LIZARD SURVEY LOCATIONS AND TUSSOCK SKINK RECORDINGS WIND FARM SITE - EAST

MAT 01
MAT 02
MAT 03
MAT 04
MAT 05
MAT 06
MAT 07
MAT 08
MAT 09
MAT 10
MAT 11
MAT 12
MAT 13
MAT 14
MAT 15
MAT 16
MAT 17
MAT 18

Service Layer Credits: Eagle Technology, LINZ

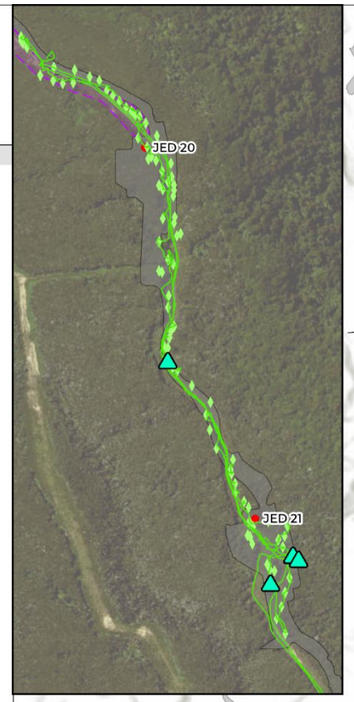
Waiarikiki
FIGURE LMP - 1b
FIGURE LMP - 1a
Redan

contact

LEGEND

Wind Farm
- Wind Turbines
- Transmission Line Route
- Indicative Fill Disposal Sites
- Jedburgh Plateau
- Civil Works Design
- Wind Farm Site

Gecko Surveys
- Tautuku Gecko Observations
- Tree ACOs (TACOs)
- Spotlighting Tracks



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	VERSION
	1.0

Kilometers
0 0.25 0.5

CREDITS:

Wildlands
Ecological data provided by Wildlands Consultants

TITLE

FIGURE LMP - 1c

TAUTUKU GECKO SURVEY LOCATIONS AND OBSERVATIONS
WIND FARM SITE - JEDBURGH

Table 1 – Key principles for lizard salvage and transfer in New Zealand and corresponding section in this LMP that details the application of each principle.

Key Principle	Summary	Section in this Document that Addresses the Principle
Lizard species' values and site significance must be assessed at both the impact (development) and receiving sites	Two 'At Risk – Declining' species have been confirmed present at the Project Site. While additional 'Threatened' and 'At Risk' species have not been confirmed during preliminary and targeted surveys, they may be present at undetectable levels in limited habitats within the Project Site.	Section 2.0, 5.0
Actual and potential development-related effects and their significance must be assessed	Effects include, but are not limited to disturbance during earthworks, death and injury, fragmentation of habitat, loss of indigenous habitat, ongoing disturbance, and increased predation to lizards.	Section 3.0
Alternatives to moving lizards must be considered	Alternatives to moving lizards, have been considered for 'At Risk' species, including avoidance during detailed design.	Section 4.0
Threatened species require more careful consideration than less-threatened species	There is a *very low* possibility that the 'Threatened – Nationally Critical' green skink may be present on site. Incidental discovery protocols will be in place, and directed compensation will be triggered if the species is discovered prior to vegetation clearance.	Section 2.0, 3.2, 4.8.2, 4.9
Lizard salvage, transfer and release must use the best available methodology	Salvage is required in areas within Jedburgh Station and Matariki Forest.	Section 4.4.2, 4.5.2, 4.7
Receiving sites and their carrying capacity must be suitable in the long term	Two release sites have been surveyed in locations where tussock skinks are present, and the sites are therefore suitable for the species. A release area for Tautuku gecko has been identified and will be fenced and used as a soft release area for the species. These release sites will be suitably enhanced and protected to provide long term increases to the lizard populations.	Section 5.0
Monitoring is required to evaluate the success of the salvage operation	Monitoring will be required at the tussock skink release sites if enough lizards are salvaged. In addition, monitoring will be undertaken within the Jedburgh Station Ecological Enhancement area in order to determine conservation benefit to 'At Risk' Tautuku gecko.	Section 6.0
Reporting is required to communicate outcomes of salvage operations and facilitate process improvements	• A compliance report will be submitted annually (1 July to 30 June) during construction to DOC and Environment Southland and Southland District Council during the construction phase of the project (by 30 September each year). • Reporting requirements outlined in the WAA will be adhered to and submitted to DOC annually for the year 1 July – 30 June by 30 September, each year.	Section 7.0
Contingency actions are required when lizard salvage and transfer activities fail	Contingency actions include: • Management for discoveries of species At Risk and Threatened not already recorded from the site. • Management measures where more lizards than expected are salvaged. • Management for if monitoring detects declines in occupancy.	Section 6.4

1.4 Lizard management approach

Any lizard management must be carried out in consultation with DOC and Te Ao Marama Incorporated ("TAMI") /mana whenua.

Delivery of, and compliance with this LMP will be the responsibility of the Environmental Manager who will liaise with the Site Manager, site engineer(s), Project Ecologist, Project Herpetologist and vegetation clearance and earthworks contractors as required.

1.4.1 Implementation of the Lizard Management Plan

The implementation of the LMP will be under the direct supervision of a suitably qualified and experienced herpetologist[1] who will work closely with the Environmental Manager.

The responsibilities of the Environmental Manager are to:

- Facilitate a project start-up meeting with the Environmental Manager, Project Herpetologist, site manager, site engineer(s) and vegetation clearance and earthworks contractors before the earthworks season commences to determine habitats scheduled for clearance to enable forward planning and avoid delays in the construction schedule;
- Contact the Project Ecologist(s) and Project Herpetologist a minimum of 20 working days before any of the relevant lizard management areas shown in Figures 2a and 2b and Table 2 below are scheduled for clearance;
- Invite mana whenua to participate in and support any translocation deemed necessary and appropriate to ensure appropriate exercise of kaitiakitanga responsibilities and that cultural concerns are addressed;
- Maintain clear lines of communication with the Project Ecologist(s), Project Herpetologist, site manager, site engineer(s) and vegetation clearance and earthworks contractors regarding changes in the works schedule; and,
- Brief new personnel about the vegetation clearance contractor's responsibilities under this plan.

All personnel working on site are responsible for alerting the Project Ecologist(s), Project Herpetologist, Site Engineer(s), and the Environmental Manager upon discovery of any 'At Risk' or 'Threatened' lizards not otherwise identified in this management plan.

The Project Herpetologist is responsible for reporting the discovery of 'At Risk' or 'Threatened' lizards to the Local Area Manager (DOC) and for maintaining a database with an incident register and file log of actions taken for each discovery of an 'At Risk' or 'Threatened' lizard not otherwise identified in this LMP.

A rough implementation timeline and summary is provided in Table 3.

[1] Defined as a "Suitably qualified and experienced person" in the substantive application.

Table 2 – Sites scheduled for clearance, where lizard management is required.

Site	Management	Road	Turbine location
Matariki Forest			
MAT-09	Salvage	✓	✓
MAT-10	Salvage	✓	✓
MAT-11	Pre-clearance checks	✓	
MAT-14	Salvage	✓	✓
MAT-15	Salvage	✓	
MAT-16	Salvage		✓
Jedburgh Station			
JED-11	Salvage and pre-clearance checks	✓	✓
JED-20	Salvage and pre-clearance checks	✓	✓
JED-21	Salvage and pre-clearance checks	✓	✓
JED-26	Pre-clearance checks		✓
JED-28	Salvage	✓	✓
JED-29	Pre-clearance checks	✓	
JED-30	Pre-clearance checks	✓	
JED-31	Pre-clearance checks	✓	✓
JED-32	Pre-clearance checks	✓	✓
JED-33	Salvage and pre-clearance checks	✓	✓
JED-34	Salvage and pre-clearance checks	✓	✓

1.4.2 Pre construction Geotechnical Investigations and enabling works

Geotechnical and enabling works are required prior to the commencement of general construction activities. Therefore, in order to mitigate the potential adverse impacts of the geotechnical investigations, this LMP will be adhered to where required.

Geotechnical works will require a smaller area of vegetation clearance (within a subset of the Project footprint already proposed for disturbance and earthworks) and lizard management required will be considered on a case-by-case basis by the Project Herpetologist within these areas and proportionate to the estimated number and species of lizards salvaged.

Table 3 – Indicative implementation schedule for lizard management at the Wind Farm Site. Actions are listed in order of priority and timeline.

Action	Description	Timeline/approach	Constraints	Relevant section
1 year to 7 months prior to works commencing.				
Salvage preparation (Tautuku gecko)	Install an additional 100 tree-mounted Artificial Cover Objects (TACOs) within high-risk areas.	• At least 6 months prior to LMP implementation. • 7 months prior to earthworks/vegetation clearance.	Installation at least seven months prior to vegetation clearance commencing, if it is to commence in spring.	Section 4.5.2 – Additional TACO effort.
Six - one month(s) prior to works commencing				
Salvage preparation – release sites (Section 5.0)	Construct release pens for Tautuku gecko (Jedburgh) and leaky fence for skinks (Matariki).	• Tautuku gecko: between 3-6 months prior to salvage beginning.	Access to Jedburgh may be complicated due to access tracks and weather, plan to complete in dry weather.	Section 5.4.1. – Release pen, 5.3.1 – Leaky fence.
		• Skinks: at least three months prior to salvage beginning.	Note that a fence around the Matariki release site will not be required to be completed prior to geotechnical investigations commencing.	
	Undertake baseline monitoring at release sites for skinks.	• At least two months prior to salvage beginning.	Must be implemented at least **two months prior** to any tussock skink salvage.	Section 6.1 – Baseline surveys
	Implement predator control and enhancement at all release sites.	• At least one month prior to salvage beginning.	Must be implemented at least **one month prior** to any tussock skink or Tautuku gecko salvage.	Section 5.4.3 – release sites and mammalian predator management.
	At MAT 10 and JED 28 a barrier fence will be constructed between the works area and all identified tussock skink habitat to prevent lizards in this area from escaping into the works area,	• At least one month prior to salvage beginning.	Requires supervision by Herpetologist to ensure that it is constructed in a way that minimises impacts to lizards.	Section 4.7.3 – prior to work commencing.
Pre-clearance ACO checks – all species	Undertake pre-clearance checks of ACOs for lizards twice a week for six weeks.	• At least two months prior to vegetation clearance commencing.	Must be implemented with notice in fine weather conditions (see 4.7.2.) in lizard active season.	Section 4.4.2, 4.5.2 Tussock skink and Tautuku gecko management.

Action	Description	Timeline/approach	Constraints	Relevant section
Less than one month before works commence				
Salvage preparation	Install pitfall traps at tussock skink salvage sites.	Up to one week prior to salvage commencing. TBC timing dependent on-site construction timeframe.	Must be implemented with notice in fine weather conditions (see LMP) in lizard season.	Section 4.4.2 – Salvage and transfer.
Salvage – tussock skink	Open and check traps for tussock skinks.	Commences at least one month prior to vegetation clearance commencing.	Reliant on above measures being in place. Must be implemented with notice in fine weather conditions in lizard active season.	
Following commencement of site works				
Salvage - Tautuku gecko	Supervised clearance	During vegetation clearance under defined circumstances.	During lizard active season (see 4.7.2).	Section 4.5.2 – Supervised clearance.
Enhance release sites	Add coarse woody debris into the release sites.	Following vegetation removal at the Wind Farm Site, *outside of lizard habitats.*	Reliant on open communication with contractor.	Section 5.2 – Skink release.
First season following salvage				
Post-release monitoring	Post release monitoring for tussock skink.	First available lizard season post-release for five years – if threshold met.	This may be dependent on release site access (due to construction activities). During lizard active season (see 4.7.2).	Section 6.1.
	Post-release monitoring for Tautuku gecko	First available lizard season post release – if threshold met.	This may be dependent on release site access (due to construction activities). During lizard active season (see 4.7.2).	Section 6.1.
Release pen removal – Tautuku gecko (Section 5.4)	Removal/deconstruction of Tautuku gecko release pen 6-12 months following last gecko release.	6-12 months following last release.	This may be dependent on release site access (due to construction activities).	Section 5.4.2.
Monitoring – Tautuku gecko (Section 6.2)	Monitoring for Tautuku gecko if more than five are detected.	First available lizard season post-release for ten years. Installation of monitoring equipment required at least six weeks before.	During lizard active season (see 4.7.2).	Section 6.2.
Following final tussock skink salvage				
Leaky fence removal – tussock skink	Removal/deconstruction of leaky fence following last tussock skink release/ completion of lizard salvage.	6-12 months following last tussock skink release.	**ONLY** if no green/herbfield skinks are salvaged. If green skinks are salvaged, the fence will remain in place for the life of the windfarm.	Section 5.3

Action	Description	Timeline/approach	Constraints	Relevant section
Following turbine construction				
Ungulate exclusion	Construct deer fence – exclude ungulates at Jedburgh Station Ecological Enhancement Area and Copper Tussock Enhancement and Skink Protection Area.	Following the completion of the construction of all wind turbines within 150m of the deer fence around the Jedburgh Station Ecological Enhancement Area and Copper Tussock Enhancement and Skink Protection Area.	N/A	Section 5.0 – release site; HREP.
No timing constraints				
Contractor preparation	Provide timeline of implementation and construction/vegetation clearance to all contractors.	Consent and permits must be issued/authorised.	No timing constraints.	Section 1.4.1, Appendix 4.
	Distribute Incidental Discovery Protocol and undertake induction with relevant contractors	Five working days prior to enabling works and construction activities commencing.	No timing constraints.	

2.0 Lizard Values

2.1 Desktop assessment

Observations from the DOC BioWeb Herpetofauna Database within 30 kilometres of the Wind Farm Site were assessed. Records older than 50 years were excluded from the database search. The likelihood of occurrence for each species is given, based on their known habitat preferences and distribution in the area and surrounds. The desktop assessment was used to provide context for lizard fauna recorded within the Wind Farm Site and inform an assessment of ecological values for the Southland Wind Farm (Table 4). These are detailed in the Ecological Impact Assessment prepared by Wildland Consultants (2025).

2.2 Field survey

2.2.1 Background

The methods and results of the preliminary habitat assessments and surveys are detailed in the Ecological Assessment (Wildlands 2025[1]). During these surveys, tussock skinks and Tautuku gecko were confirmed on site. Complete survey effort is displayed in Figure 1 a, b and c.

2.2.2 Field survey methods

The following survey methods were implemented at the Wind Farm Site to detect terrestrial skinks and arboreal geckos. Prior to surveys at each proposed structure, road or wind turbine location, vegetation and habitats were assessed and described as either suitable or unsuitable for lizards. Tracking tunnels were then used across the Wind Farm Site to determine the presence of terrestrial skinks. Following tracking tunnel surveys, survey equipment was installed to detect relative abundance and species diversity at the sites in vegetation types determined to have lizard values. Most survey equipment has been left on site, and will receive final checks prior to works commencing. Surveys were mostly undertaken within the proposed construction footprint of the Wind Farm site, due to access constraints (rough terrain, large site with limited access to move equipment around).

Terrestrial skinks

Sixty-five tracking tunnels were installed across representative lizard habitats in 2022 and were checked in January 2023 and again in April 2023. Tracking tunnels were placed in transects of five approximately 20 metres apart.

Three hundred and sixty-seven single layer Onduline Artificial Cover Objects (ACOs) were deployed at each relevant site on the ground and left for at least six weeks in order to weather into the environment and allow time for skinks to occupy them. ACOs were spaced approximately 10-20metres apart within lizard habitats at each impact site. All ACOs were checked across four days in February 2024.

Gee's minnow (funnel) traps were placed at two sites at Matariki-Venlaw forest. Twenty-five were set and checked over four days in February 2024, and 14 were set and checked over four days in April 2024. The funnel traps were baited with 'berry bliss lolly' (Natural Confectionary Company Ltd™), and vegetative padding added to provide shelter and prevent desiccation, and to prevent mice from predating captured skinks. Each funnel trap was covered with vegetation or nestled into the surrounding vegetation (as per the Department of Conservation Herpetofauna Monitoring Toolbox for Funnel Trapping; Hare, 2012).

[1] Statement of evidence of N. Goldwater and K. Lloyd, Wildland Consultants (2025). Southland Wind Farm Technical Assessment: Terrestrial and Wetland Ecology. Contract Report No. 6656r. Prepared for Contact Energy Ltd.

Tautuku gecko and adaptive survey methods

Initial spotlight searches were undertaken for Tautuku gecko in March 2023 but did not detect any geckos. Weather conditions were unfavourable during the spotlight search. Recent monitoring for Tautuku geckos has determined that methods (such as the use of arboreal ACOs) are more effective than standard accepted methods for arboreal lizards (spotlighting) (Knox, C. Pers. Comm, and Wildlands 2023b).

Diversifying search methods to account for the unpredictable weather conditions within the site allows for a better chance of detection of this cryptic species. Other methods used for this species, such as bark stripping on mature trees (Wildlands, 2023a) is not appropriate for this site due to the lack of emergent rimu forest (where trees have large flaked bark). Therefore, 65 tree-mounted ACOs (TACOs) were installed in December 2023 and February 2024. The TACOs were constructed using two double layered Onduline, broadly following the methodology outlined in Turner (2021), and were placed at specific sites that were most likely to detect Tautuku gecko, including forest edges and mature forest. These were left for more than six weeks to allow for geckos to occupy them.

An additional 119 TACOs were installed in October 2024. These were installed in the same areas as the ACOs installed the previous years, with TACOs installed on trees of various diameter at breast height (DBH) and a diversity of species. Care was taken to ensure TACOs were placed on tree trunks with sufficient light (which was difficult within JED33-34 sites, owing to the closed canopy of the forest), and loose bark (mountain holly and manuka). Following the detection of Tautuku gecko at JED 21, additional effort was sought to delimit the distribution of the geckos beyond the capture locations outside of the project footprint. Spotlighting was opportunistically undertaken in optimal conditions in April 2025 over two consecutive nights.

Limitations to surveys

Lizard survey methods sometimes have poor detection rates because of typically low population densities, species' cryptic colouration, difficulty in surveying preferred habitats and behaviour/activity patterns. As such, even intensive lizard surveys are unlikely to detect all individuals in the population or, possibly, all species present. Further, surveys for lizards across the site was constrained due to the difficulty in accessing areas outside of the farmland and adverse weather conditions at the site.

Table 4 – Results of the DOC Bioweb herpetofauna database search within a 30-kilometre radius of the Wind Farm Site and an assessment of the likelihood of the presence of these species at the Wind Farm Site. Conservation status as per Hitchmough et al. (2021). Database accessed in August 2023.

Species	Common name	Conservation status	Record distance (km)	Preferred habitats	Likelihood of occurrence
Tussock skink	*Oligosoma chionocloescens*	At Risk - Declining	Confirmed on site during preliminary surveys	[Mānuka]/tauhinu-inaka-Veronica odora-scrub and shrubland; Mānuka-inaka-(gorse) scrub and shrubland; Exotic grassland; Fen wetland; Copper tussock grassland, mānuka-gorse/copper tussock grassland.	**Confirmed** during site surveys.
Tautuku gecko	*Mokopirirakau "southern forest"*	At Risk - Declining	15.2 km (2020)	Pahautea/southern rātā-kāmahi forest, Southern rātā-kāmahi forest; Mānuka-haumakaroa-mountain holly forest; Mānuka forest and scrub.	**Confirmed** during site surveys.
Herbfield skink	*Oligosoma murihiku*	At Risk - Declining	28 km (1982)	Pahautea/southern rātā-kāmahi forest, Southern rātā-kāmahi forest; Mānuka-haumakaroa-mountain holly forest; Mānuka forest and scrub; Fen wetland; Copper tussock grassland, mānuka-gorse/copper tussock grassland.	**Likely** – within shrubland, wetlands and sub-alpine scrub
Kōrero gecko	*Woodworthia* "Otago/Southland large"	At Risk - Declining	1.8 km (2001)	Pahautea/southern rātā-kāmahi forest, Southern rātā-kāmahi forest; Mānuka-haumakaroa-mountain holly forest; Mānuka forest and scrub; Mānuka-inaka-(gorse) scrub and shrubland	**Unlikely**- more likely where abundant retreat sites (such as rock crevices) are present, which there are minimal available at the Wind Farm Site.
Green skink	*Oligosoma chloronoton*	Threatened - Nationally Critical	14.6 km (1987)	Mānuka-inaka-(gorse) scrub and shrubland; Exotic grassland; Fen wetland; bog wetland, Copper tussock grassland, mānuka-gorse/copper tussock grassland.	**Possible** – there may be a relict population present, but difficult to detect.
McCann's skink	*Oligosoma maccanni*	Not Threatened	14 km (1980)	Exotic grassland; Fen wetland; bog wetland, Copper tussock grassland, mānuka-gorse/copper tussock grassland.	**Unlikely** given habitats and conditions at the site (damp and unfavourable)

2.2.3 Field survey results

Fifty tussock skinks, six Tautuku gecko and eight skink prints have been detected during surveys between 2022 and 2025. The catch per unit effort (CPUE) for the Wind Farm Site is 0.017, which reflects a very low density of lizards encountered. However, some surveys were undertaken in unfavourable weather conditions and are likely to have influenced the catch per unit effort. The surveys indicate that detectability is optimal between and (inclusive), between December and March (inclusive). Therefore, any additional surveys, or preclearance TACO checks should be undertaken during this time. The survey results also indicate that while checking TACOs in autumn is seemingly optimal for Tautuku gecko in lowland podocarp forest habitats, it is not suitable for this site due to the site elevation and lack of emergent podocarps (Wildlands, 2023b). TACO occupancy occurs between three months and one year of establishment at this site, and likely reflects findings by Turner *et al* 2024).

Refer to the ecological evidence prepared by Wildland Consultants (2025)[1] and Appendix 1-3 for details regarding preliminary survey results at the Wind Farm Site. A summary is provided in Table 5 below.

To date, significant survey effort has been undertaken at the Wind Farm Site in habitats that lizards are most likely to be present. The surveys largely focused on the impact area due to major access constraints and the nature of the habitats within the impact sites. No other species have been detected at the Wind Farm Site, and detections of additional species are considered unlikely unless significant additional effort is undertaken (i.e. during salvage).

Table 5 – Lizard survey results summary. Table includes all methods and lizards detected between 2022-2025.

Survey period	Location	Sampling method	Effort	Results
December-January, April 2022-23	Jedburgh and Matariki	65 x Tracking tunnels	2 TT checks	Skink prints detected on 8 tunnels (12.31%)
April 2023	Jedburgh	140 x ACOs Spotlighting	552 ACO checks 4 person hours	5 tussock skinks.
	Matariki			
12-16 February 2024	Jedburgh	231 ACOs	1155 ACO checks	43 tussock skinks
	Matariki	25 Funnel traps 136 ACOs	100 funnel trap checks 680 ACO checks	
5-9 April 2024	JED06, 20-21, 29-30, 33-34	65 TACOs, 10 ACOs	189 TACO checks 10 ACO checks	Nothing detected.
	MAT16	14 ACOs, 14 funnel traps	28 ACO checks 31 funnel trap checks	Nothing detected
16 February-11 April 2025	JED06	20 TACOs	60 checks	Nothing detected.
	JED20-21	91 TACOs Incidental ACO checks	546 checks	3 Tautuku gecko observed. 2 Tussock skinks
		Spotlighting	7 hours	2 Tautuku gecko observed.
	JED29-30	19 TACOs	114 checks	Nothing detected.
	JED33-34	64 TACOs	384 checks	1 Tautuku gecko observed.

[1] Statement of evidence of N. Goldwater and K. Lloyd, Wildland Consultants (2025). Southland Wind Farm Technical Assessment: Terrestrial and Wetland Ecology. Contract Report No. 6656r. Prepared for Contact Energy Ltd.

Survey period	Location	Sampling method	Effort	Results
Summary		**65 tracking tunnels** **507 ACOs** **194 TACOs** **Spotlighting**	**130 Tracking tunnels** **131 Funnel traps** **2,425 ACOs** **1,104 TACOs** **11 hours spotlighting**	**8 x skink prints.** **50 x Tussock skinks.** **6 x Tautuku geckos.**

2.3 Lizard habitats

Lizard habitat preference is detailed below. Lizard habitats are present throughout the Wind Farm Site, but species, such as Tautuku gecko are limited to existing indigenous forest habitats (southern rātā-kamahi forest) and any vegetated forest habitats that are adjacent to them (mānuka forest and scrub). Further, the observations of Tautuku gecko to date show that they are present in discrete areas of the site, and are likely to be at low densities. The existing mānuka forest and scrub vegetation type is present across Jedburgh Plateau and has been establishing at the site over the last 30 years. While it appears as though Tautuku gecko are restricted to habitats adjacent to the Southern rātā-kamahi forest, it is possible that they are present throughout some of the more intact mānuka forest and scrub between JED 20 and JED 11. While some spotlighting has been undertaken in this area, it is insufficient to determine presence, and thorough delimiting surveys would determine this.

Tussock skink, are generalist and appear to be persisting in low numbers in a variety of vegetation types across the Wind Farm Site. Tussock skinks have been detected along many road or existing accessways at the site, and this is where they are highest in density. Tussock skinks have been detected in the following habitat types at the Wind Farm Site:

- Exotic unmanaged grassland (including unmaintained road verges).
- Copper tussock grassland.
- [Mānuka-gorse]/copper tussock grassland.
- [Mānuka]/tauhinu-inaka-Vernonica odora scrub and shrubland.
- [Wilding conifers]/copper tussock shrubland.
- Mānuka scrub/shrubland.

It is possible that herbfield skink (not yet detected) are present within the copper tussock grassland and/or [Mānuka-gorse]/copper tussock grassland. If present, **green skink are most likely to be detected within copper tussock grassland.**

3.0 Effects on lizards

3.1 Overview

Most of the lizard habitat within the Wind Farm Site will be avoided due to the relatively small footprint of the roads and turbines. Effects on lizards have been minimised through the use of pre-existing roads to the greatest extent possible. High quality lizard habitat cannot be avoided at the following turbine and road locations:

- MAT-09
- MAT-10
- MAT-14
- MAT-15
- MAT-16
- JED-20
- JED-21
- JED-28
- JED-33
- JED-34

Intensive search and salvage effort will be required at these locations. In addition, some sites may require geotechnical investigations, which will cause effects to the same areas in a smaller footprint, prior to the main earthworks occurring.

3.2 Potential effects

Without mitigation, lizard populations may be reduced, and there would be a permanent loss of habitat extent and reduced habitat connectivity.

Specifically, direct effects such as accidental injury and/or death, and disturbance from earthworks are likely to have the most significant impact. Other identified effects are likely to have limited effects without mitigation. These have been identified in ecological evidence prepared by Wildland Consultants (2025), and are listed below.

- Accidental injury/death/displacement during earthworks.
- Disturbance to lizards during earthworks.
- Loss of indigenous lizard habitat through road widening and construction, and turbine construction.
- Fragmentation of lizard habitats, from the creation of new roads and turbine platforms.
- Ongoing disturbance (vehicle strikes, human activity during turbine maintenance).

4.0 Management of Effects

4.1 Overview

Lizard salvage and transfer is only appropriate if avoidance and remediation measures have not resulted in, or cannot result in, no-net-loss of lizards from the development area (DOC 2019). In the section below, the mitigation hierarchy is detailed, and we describe how potential effects may be avoided, remedied, or mitigated in the first instance.

Potential adverse effects on lizards that are associated with the construction within the wind farm Project footprint will be avoided, remedied or mitigated through:

- General refinement of the Project footprint through detailed design and construction methodology where possible (detailed in the VMP);
- **Seasonal constraints** on vegetation clearance (vegetation clearance only during lizard active season, or following salvage/mitigation activities) (detailed in the VMP);
- Vegetation clearance protocols to minimise the potential for effects outside the required project footprint (detailed in the VMP); and
- Salvage and transfer for tussock skink and Tautuku gecko where necessary (Table 2).

To address significant residual adverse effects on lizards and other terrestrial biodiversity values that cannot be avoided, remedied or mitigated, a range of habitat restoration and enhancement measures will be implemented as per the HREP. These measures include pest animal and plant control, enhancement planting, and erecting fences to exclude ungulates. Key management options for lizard species that may be present at the Wind Farm Site are summarised in Table 6.

4.2 Geotechnical investigations

As per Section 1.4.2, management interventions outlined below may be implemented where necessary for any preliminary geotechnical investigations, prior to the main construction activities commencing. At least two weeks prior to these works, a notification will be delivered to Southland District Council (SDC), DOC and mana whenua including the following:

- Wildlife Act approval number.
- Site names and locations.
- Description of management of effects required.
- Number and size of areas to be disturbed.

Following implementation of any management required, a short note will be provided to the above regarding the management interventions taken, any lizard management changes required, and number of lizards salvaged from the site. All activities will be detailed in full and delivered in the annual report (Section 7).

4.3 Effects management hierarchy

Table 6 outlines how effects on each lizard species present (or potentially present) will be avoided, minimised (including through salvage), remediated, or compensated for.

Table 6 – Summary of proposed lizard management options for each species at Southland Windfarm.

Species	Management type	Detail
Tussock skink (At Risk – Declining)	**Avoidance**	Complete avoidance of key habitats or any site with a high number of skinks (e.g. MAT-9 and MAT-10) is not possible due to the other (non-ecological) constraints on turbine locations
	Minimise	Salvage and transfer to an enhanced release site with ongoing predator control. Post-release monitoring.
		Detailed design: reduce footprints as much as possible within tussock skink habitats.
		Pre-clearance checks at low density sites.
		Incidental discovery protocol and contractor induction (Appendix 4)
		Lizard and invertebrate friendly planting will be undertaken adjacent to fill sites and infrastructure (as per the HREP). Add lizard refugia (i.e. stacks of removed vegetation) within road edges to allow protection from predators and refuge options.
	Compensation	Habitat enhancement at the release site will provide protective benefits to the species.
Tautuku gecko (At Risk – Declining)	**Avoidance**	During pre-clearance checks, avoid clearance of mature trees (10 cm DBH) where geckos are present, where practicable.
	Minimise	Install additional tree-mounted ACOs in habitats where geckos have been detected six months prior to clearance. Pre-clearance checks of tree-mounted ACOs. Supervised clearance where geckos are present. Salvage and transfer.
		Detailed design: Work with engineers during detailed design to minimise and avoid clearance of Tautuku gecko vegetation as much as possible.
		Reduce road width in forested habitats to the extent practicable to reduce fragmentation effects.
		Incidental discovery protocol and contractor induction (Appendix 4).
	Compensation	Habitat enhancement through predator control and ongoing outcome monitoring to determine effects of predator control. Compensation directed at long term monitoring of Tautuku gecko.
Herbfield skink (At Risk – Declining)	**Avoidance**	No herbfield skinks have been detected; low risk of detection during habitat clearance.
	Minimise	If present herbfield skinks are most likely to be discovered during salvage undertaken for tussock skink. **Incidental discovery protocol** and contractor induction (Appendix 4): Salvage and transfer to leaky fence release area, with predator control and enhancement.

Species	Management type	Detail
Green skink (Threatened – Nationally Critical)	**Avoidance**	No green skinks have been detected, low risk of detection during habitat clearance. ***If discovered during pre-clearance checks*:** Stop works. Avoid habitats where possible.
	Minimise	If discovered and avoidance is not possible, salvage and transfer to the leaky fence area in the Copper Tussock Enhancement and Skink Protection Area adjacent to MAT-10.
		Incidental discovery protocol and contractor induction (Appendix 4): Stop works, notify the Department of Conservation, and develop further instructions. Salvage and transfer if possible.
	Compensation (if deemed necessary)	***If discovered*:** Specific compensation directed to green skink. Construct a predator proof area at a known population of green skink, which is likely to provide conservation benefit from sustained intensive predator control.
Any other species	**Species dependent – determined in consultation with the Department of Conservation.**	**Incidental discovery protocol** and contractor induction (Appendix 4).
		Management actions determined following consultation with DOC.

4.4 Tussock skink management

A summary of the sites where tussock skinks have been recorded, and a summary of the management action proposed is provided in Table 7.

Table 7 – Sites where tussock skinks have been observed during surveys, and a summary of management required.

Site	Road access	Turbine location	Management action	Timeframe
MAT 09	✓	✓	Salvage	One month-two weeks prior to clearance at each site[1]
MAT 10	✓	✓	Salvage	
MAT 11	✓		Pre-clearance checks	
MAT 14	✓	✓	Salvage	
MAT 15	✓		Salvage	
MAT 16		✓	Salvage	
JED 20	✓	✓	Salvage, pre-clearance checks	
JED 21	✓	✓	Salvage, pre-clearance checks	
JED 26		✓	Pre-clearance checks	
JED 28	✓	✓	Salvage	
JED-32	✓	✓	Salvage, pre-clearance checks	
JED-31	✓	✓	Pre-clearance checks	

4.4.1 Avoidance

Many lizard habitats will be avoided within the Wind Farm Site. However, where the construction of turbine platforms and new roads will be undertaken in known or potential lizard habitats, avoidance will not be practicable.

[1] This time allows for checks to occur over consecutive days (including weekends), which provides more time for ideal weather conditions).

4.4.2 Minimise

Detailed design

It is possible that during the detailed design phase the extent of turbine and road ways can be minimised or moved to avoid lizard habitats.

Pre-clearance checks

All previously installed ACOs will be checked once a day for seven working days prior to vegetation clearance. This may be carried out in conjunction with salvage works at another nearby site (e.g. pre-clearance checks may be carried out at MAT 11 in conjunction with salvage at MAT 09 and 10) (Figures 2a and b).

Salvage and transfer

Salvage of tussock skinks will occur at nine sites (Table 7; Figures 2a and b), including along access roads, where required. Two dedicated release sites will be prepared nearby for tussock skink, which will receive targeted predator control and habitat enhancement (Figure 3).

The two release sites are:

- An approximately 0.48-hectare site adjacent to the Wind Farm Site road access between turbines JED-28 and JED-29, where tussock skinks have been previously captured (**Jedburgh Plateau Skink Protection Area**).
- Within the approximately 8-hectare **Copper Tussock Enhancement and Skink Protection Area** discussed above, which is on Matariki Station between turbines MAT-09 and MAT-10.

Lizard (pitfall) traps will be placed at five-metre spacings, throughout the identified areas of lizard habitat at each impact site (as required, at the discretion of the Project Herpetologist). Traps used will be a mix of funnel or pitfall traps. If mice are caught in traps, these will be humanely euthanised on site, and if predation by mice is detected, funnel trapping will cease immediately. All live capture traps will be baited with canned pear or Berry Bliss lollies (Natural Confectionary Co.™, a known lizard attractant).

Pitfall traps consist of a plastic container (>2 litre depth) dug into the ground which lizards may fall into and be unable to exit. The pitfalls will be covered with Onduline (pre-existing in the habitat from targeted surveys) to provide additional thermoregulatory advantages and attract more lizards to the traps. Pitfall traps will be installed one week prior to habitat clearance and will be closed during this time to allow for lizards to habituate the area and for the traps to weather in (Hare 2012b).

To prevent harm to lizards, pitfall traps will be closed when not in use (either with a sealed lid and/or by filling them with rocks). When active they will contain a damp sponge to prevent desiccation of skinks within the trap.

Gee's minnow traps (funnel traps) will have grass padding added to provide shelter and prevent desiccation, and to prevent mice from predating caught skinks. The funnel trap will be covered with or nestled into the surrounding vegetation (as per the DOC Herpetofauna Monitoring Toolbox for Funnel Trapping; Hare 2012b).

Once active, all traps will be checked daily for a minimum of seven consecutive days. If trapping reveals trends of decreasing numbers of skinks over the course of seven days, with ≤1 skink captured by day seven, trapping will cease. If >1 skink is caught on day seven, trapping will continue until a decline is observed, at the discretion of the Project Herpetologist.

If traps catch **herbfield skink**, trapping will continue for another three days, or until no more herbfield skinks are caught, at the discretion of the Project Herpetologist.

Skink habitat creation

Approximately 1.6 hectares of indigenous planting will be undertaken at eight discrete areas to create habitat for tussock skinks (and invertebrates) as per the HREP. The plantings will comprise copper tussock whaririki/mountain flax, and low-stature shrubs.

Incidental discovery during works

If tussock skink is discovered during vegetation clearance work, the Incidental Discovery Protocol will be followed.

4.4.3 Compensation

Compensation aims to provide protective benefit to residual populations of skinks not caught during salvage. In this regard, the HREP will provide habitat enhancement for populations of tussock skink in an unaffected area of the site between MAT-09 and MAT-10 (referred to as the Copper Tussock Enhancement and Skink Protection Area), as well as ongoing predator control, which is likely to be sufficient for this species.

4.5 Tautuku gecko management

Tautuku gecko have been discovered on site during surveys. Sites where Tautuku gecko may be present are listed below in Table 8 and Figure 1c.

4.5.1 Avoidance

Most of the Tautuku gecko habitats will be avoided within the Wind Farm Site. However, as previously noted, where the construction of turbine platforms and new roads will be undertaken, avoidance may not be possible.

4.5.2 Minimise

Detailed design

It is possible that during the detailed design phase of the project the extent of turbine and road ways can be minimised or moved to avoid lizard habitats. There is potential to reduce fragmentation effects from road construction between JED-33 and JED-34 (i.e. reduce to a narrower carriageway less than eight metres wide) to allow for canopy gaps to be reduced, and reduce the risk of vehicle strike.

Additional TACO effort & manual searches pre-clearance checks

Additional TACOs will be installed at JED-20, JED-21, JED-33 and JED-34 to ensure that all representative habitats receive sufficient search effort during pre-clearance checks. These will be installed a minimum of three months prior to checks beginning, in order to allow any geckos time to habituate to the covers. TACOs will be installed on trees which have sufficient sunlight and/or proximity to contiguous canopy cover.

All installed TACOs will be checked six times **between three and six weeks** prior to vegetation clearance[1]. Manual searches of trees will also be undertaken at the same time, where cavities and loose bark will be checked and stripped from manuka trees proposed for clearance.

[1] Twice weekly checks across a three-week consecutive period (including weekends) allows for more time to have ideal weather conditions for checks to occur.

Table 8 – Sites where Tautuku gecko may be present, and management required.

Site	Road access	Turbine location	Surveys completed	Confirmed present during site surveys	Management	Timeframe (approx.)
JED 06		✓	Yes	No	Pre-clearance checks of existing TACOs	A minimum of 30 working days prior to clearance
					If geckos are detected, supervised clearance and retain vegetation post clearance.	During clearance
JED 11	✓	✓	No	No	Install 50-75 TACOs.	A minimum of three months prior to clearance
					Pre-clearance checks	A minimum of 30 working days prior to clearance
					Supervised clearance and retain vegetation post clearance.	During clearance.
JED 12	✓	✓	No	No	*Incidental discovery protocol*	During clearance.
JED 20	✓	✓	Yes	Yes (road)	Additional TACO installation (25-50 units).	A minimum of three months prior to clearance
					Pre-clearance checks and relocation	A minimum of 30 working days prior to clearance
					Supervised clearance and retain vegetation post clearance.	During clearance
JED 21	✓	✓	Yes	Yes (road & turbine)	Additional TACO installation (25-50 units).	A minimum of three months prior to clearance
					Pre-clearance checks and relocation	A minimum of 30 working days prior to clearance
					Supervised clearance and retain vegetation post clearance	During clearance
JED 29	✓		Yes	No	Pre-clearance checks	A minimum of 30 working days prior to clearance
					If geckos are detected, supervised clearance and retain vegetation post clearance	During clearance
JED 30	✓	✓	Yes	No	Pre-clearance checks	A minimum of 30 working days prior to clearance
					If geckos are detected, supervised clearance and retain vegetation post clearance.	During clearance
JED 33	✓	✓	Yes	Yes (road)	Additional tree-mount ACO installation (25-50 units).	A minimum of three months prior to clearance
					Pre-clearance checks and relocation.	A minimum of 30 working days prior to clearance
					Supervised clearance and retain vegetation post clearance.	During clearance
JED 34	✓	✓	Yes	Yes (road & turbine)	Additional tree-mount ACO installation (25-50 units).	A minimum of three months prior to clearance
					Pre-clearance checks and relocation.	A minimum of 30 working days prior to clearance
					Supervised clearance and retain vegetation post clearance.	During clearance

Salvage and transfer

A soft release pen will be constructed within mānuka forest south of JED-21 (in the Jedburgh Station Ecological Enhancement Area), prior to the beginning of any works. All Tautuku geckos that are captured during pre-clearance ACO checks will be safely transferred to the soft release pen. Salvage guidelines will be followed as per Section 4.5.2 below, and the construction of the release pen will follow Section 5.4 and Appendix 5.

Supervised clearance protocols

Where Tautuku geckos have been detected (during previous surveys or pre-clearance checks), manual clearance of Tautuku gecko habitat will occur (see Table 8). All manual clearance will be undertaken using suitably qualified chainsaw operators and will be supervised by a herpetologist. The herpetologist will search all felled tree branches and trunks (including all cavities, holes and loose bark) and foliage for arboreal geckos.

Where possible, loose branches with foliage attached will be hung in or placed in trees outside of the impact area to allow for any lizards to move freely between habitats. Foliage from other felled trees will be removed and placed within the surrounding habitat to provide additional habitat and refuges for lizards (this reduces the chances of any missed geckos being harmed). All other woody material will be stacked and left to provide additional refugia for geckos in the surrounding area. All felled material will be placed outside of the footprint to prevent lizards dispersing back into the construction area during works. **No vegetation will be mulched in these habitats** (see Figure 1c; 2).

If any Tautuku geckos are captured, these will be released into the pre-constructed soft release pen at the release site, following clearance for the day.

Review of supervised clearance requirements

If vegetation has been cleared and checked within a road segment or turbine footprint and no Tautuku geckos are found after five hours or fifty metres of continuous supervised clearance within a clearance area[1] (Figure 2a and b), then this method will be reviewed by the Project Herpetologist, who will determine whether herpetologist supervision will continue, be reduced, or halted within that area.

Incidental discovery during works

If Tautuku gecko are discovered during any vegetation clearance work that is not supervised by a herpetologist the Incidental Discovery Protocol will be followed (Appendix 4).

Retention of felled vegetation

Retain cut vegetation and place on the edges of habitat or within existing habitat. Note that additional planting will be undertaken throughout the 245-hectare Jedburgh Station Ecological Enhancement Area, as per the HREP.

[1] To be agreed on and set by the contractor and Project Herpetologist.

4.5.3 Compensation

Funding towards the Forest and Bird research at LENZ Reserve or another managed population such as Waikawa Valley in the Catlins will be provided by Contact to compensate for the residual effects following management for Tautuku gecko, including habitat loss, fragmentation and loss of geckos not captured during salvage. Forest and Bird currently undertake monitoring at the site, and additional funding would assist the organization to continue this work. The monitoring will provide information about a very cryptic and lesser-known species of *Mokopirirakau.* Contact will work with Forest and Bird[1] to contract a suitably qualified herpetologist to undertake monitoring at a monitoring site in Waikawa Valley for Tautuku gecko. Contact will contribute $30,000.00 to be used for this monitoring.

If Forest and Bird do not wish to accept that funding (for example, if it has discontinued monitoring), Contact will instead contract a suitably qualified Herpetologist on behalf of DOC, to undertake surveys and monitoring for Tautuku gecko. As a further option, the funding could also be provided to a research institution for research or management of Tautuku gecko.

4.6 Herbfield and green skink management

Neither herbfield nor green skink have been discovered at the Wind Farm Site. While there is a low likelihood that both could be present, management is proposed to ensure that if discovered, both species are provided protective benefit.

4.6.1 Minimise

If **herbfield skink** are discovered during pre-clearance checks, salvage, or vegetation clearance, salvage and transfer for herbfield skink will follow tussock skink guidance.

If **green skink** is discovered during pre-clearance checks or traps checked during salvage, every effort must be made to avoid habitats of this species. This may include a revision of road and turbine layout. Salvage and transfer should not be considered for **green skink** unless completely necessary, following consultation with DOC. If salvage is required, salvage will be undertaken in accordance with the tussock skink guidance.

If either species is discovered during construction work the Incidental Discovery Protocols outlined in Appendix 4 will be followed. If green skink are discovered, any works must immediately cease and the Incidental Discovery Protocol will be followed, including determining avoidance measures. Where practicable, remaining green skink habitats will be avoided.

Any green skink or herbfield skink discovered will be released into the leaky fence area within the Copper Tussock Enhancement and Skink Protection Area (Section 5.3).

[1] Forest and Bird currently oversee Tautuku gecko monitoring in the Catlins area.

contact

LEGEND

Wind Farm
- Wind Turbines
- Transmission Line Route
- Indicative Fill Disposal Sites
- Jedburgh Plateau
- Civil Works Design
- Wind Farm Site

Management Actions
- Tussock Skink Recorded
- Tautuku Gecko Observations

Species Confirmed or Likely Present
- Tautuku gecko
- Tussock skink
- Tussock skink and Tautuku gecko

Vegetation Clearance Requirements
- Supervised vegetation clearance may be required
- Supervised vegetation clearance will be required

Management Actions
- Tussock skink: Pre-clearance checks
- Tussock skink: Salvage
- Tussock skink and Tautuku gecko: Pre-clearance checks and Salvage

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	VERSION 1.0

Kilometers
0 0.25 0.5 1

CREDITS:

Wildlands
Ecological data provided by Wildlands Consultants

TITLE

FIGURE LMP - 2a

LIZARD MANAGEMENT ACTIONS
WIND FARM SITE - WEST

JED 09
JED 19
JED 34
JED 20
JED 10
JED 32
JED 33
JED 21
JED 31
JED 22
JED 30
JED 11
JED 23
JED 12
JED 05
JED 13
JED 14
JED 24
JED 29
JED 25
JED 06
JED 15
JED 28
JED 26
JED 08
JED 16
JED 27
JED 07

Tautuku gecko
· Pre-clearance checks and relocation
· Supervised clearance will be required

Tussock skink
· Salvage
· Pre-clearance checks

Tussock skink
· Salvage
· Pre-clearance checks
Tautuku gecko
· Pre-clearance checks and relocation
· Supervised clearance will be required

Tautuku gecko
· Pre-clearance checks
· Supervised clearance will be required

Tautuku gecko
· Pre-clearance checks
· Supervised clearance may be required

Tautuku gecko
· Pre-clearance checks
· Supervised clearance may be required

Tautuku gecko
· Pre-clearance checks of existing TACOs
· Supervised clearance may be required

Tussock skink
· Salvage

Tussock skink
· Pre-clearance checks

Waiarikiki
FIGURE LMP - 2b
FIGURE LMP - 2a
Redan

Service Layer Credits: Eagle Technology, LINZ

contact

LEGEND

Wind Farm

- Wind Turbines
- Transmission Line Route
- Indicative Fill Disposal Sites
- Civil Works Design
- Wind Farm Site

Management Actions

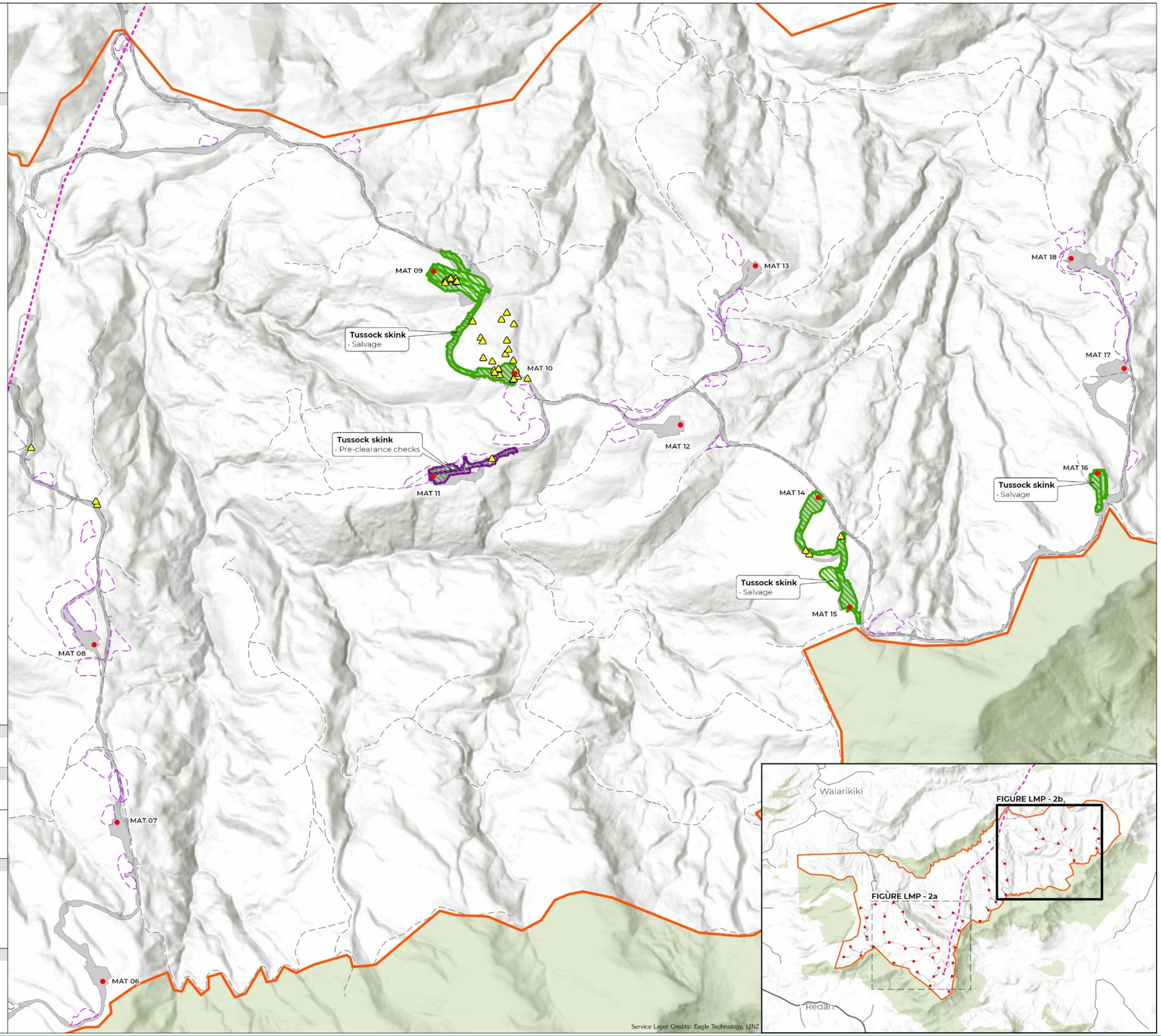
- Tussock Skink Recorded

Species Confirmed or Likely Present

- Tussock skink

Management Actions

- Tussock skink: Pre-clearance checks
- Tussock skink: Salvage



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15/08/2025

VERSION

1.0

Kilometers

0 0.25 0.5 1

CREDITS:

Wildlands

Ecological data provided by Wildlands Consultants

TITLE

FIGURE LMP - 2b

LIZARD MANAGEMENT ACTIONS
WIND FARM SITE - EAST

4.7 Summary of salvage effort and methods

4.7.1 Salvage effort

The amount of search effort and range of methods proposed for use at the Wind Farm Site is aimed to enable the removal of as many lizards as possible, representing a moderate to high proportion of the total number of lizards present.

There are inherent risks associated with lizard capture, salvage, and relocation as a management tool for mitigation purposes. In particular, there is high risk of poor capture rates for lizards during pre-survey capture and salvage activities. This will be managed by maximising lead-in time for pre-clearance capture and using a range of tools suitable to the species in question.

Table 9 addresses the approximate salvage effort required and the number of lizards estimated to be salvaged in each area of lizard habitat. It is noted that if geotechnical investigations require clearance in salvage or pre-check areas, a smaller area may be cleared first (and therefore salvaged) prior to the main construction stage commencing. This may require a subset of the traps and effort outlined in the table.

4.7.2 Weather conditions

Any supervised clearance will be undertaken at the discretion of the Project Herpetologist in the following consistent (more than three days) weather conditions between **November – March (inclusive)**[1,2]:

- The temperature is between 14°C and 25°C during the day; and
- No lower than 10°C overnight; and
- Relative humidity is between 50% and 90%; and
- Rain is no heavier than 0.1 - 2.0 mm per hour.

Pre-clearance checks and TACO surveys can be undertaken between October-March inclusive as per Section 2.2.3 following the above conditions.

Table 9 – Estimated number of traps and the manual searching effort required for each salvage location, including the estimated number of lizards that will be caught.

Site	Species likely to be present	Approximate number of traps required	Manual searches required and hrs	Estimated number of lizards
MAT 09	Tussock skink	20 + existing ACOs	Not possible	25 tussock skink
MAT 10	Tussock skink	150-200 + existing ACOs	Not possible	75 tussock skink
MAT 11	Tussock skink	Use existing ACOs	Not possible	5 tussock skink
MAT 14	Tussock skink	25 + existing ACOs	Not possible	10 tussock skink
MAT 15	Tussock skink	30 + existing ACOs	Not possible	10 tussock skink
MAT 16	Tussock skink	20 + existing ACOs	Not possible	10 tussock skink
JED 06	Tautuku gecko	Use existing ACOs	None required.	Unknown

[1] Salvage does not include the installation of equipment (except live capture traps) and enhancement at the release site, which must be done in accordance with Table 3.

[2] Weather conditions at Slopedown in months outside this time are likely to be highly variable and will result in ongoing delays to lizard management implementation. If conditions are deemed suitable (as above) and consistent in October and April, salvage may occur at the discretion of the Project Herpetologist.

Site	Species likely to be present	Approximate number of traps required	Manual searches required and hrs	Estimated number of lizards
JED 20	Tussock skink Tautuku gecko	50 skink traps, 25-50 tree-mount ACOs + existing ACOs+ TACOs	Four hours lifting bark per site + road access	10 tussock skink 10 Tautuku gecko
JED 21	Tussock skink Tautuku gecko	50 skink traps, 25-50 TACOs + existing ACOs + TACOS	Four hours lifting bark per site + road access	15 tussock skink 25 Tautuku gecko
JED 26	Tussock skink	Use existing ACOs	Not possible	5 tussock skink
JED 28	Tussock skink	150 + existing ACOs	Not possible	25 tussock skink
JED 29+30	Tautuku gecko	Existing TACOs	None required.	Unknown
JED 32	Tussock skink	Re-purpose existing ACOs	Not possible	10 tussock skink
JED 33	Tautuku gecko	50 TACOs + existing	Four hours lifting bark per site + road access	Unknown (due to extent of canopy cover)
JED 34	Tautuku gecko	50 additional TACOs	Four hours lifting bark per site + road access	Unknown (due to extent of canopy cover)

4.7.3 Prior to any work commencing

Relevant contractors, the environment manager, and other authorised personnel will undertake an induction to be briefed on the following:

- Lizard species present on site and what they look like.
- Where to look out for lizards.
- The Incidental Discovery Protocol and what to do if a lizard is found.
- Where any lizard management will be undertaken.
- The timeframe for associated works.

Barrier fence

At MAT 10 and JED 28 (Table 2, Figure 3), a barrier fence will be constructed between the works area and all identified tussock skink habitat to prevent lizards in this area from escaping into the works area, as well as to prevent any sedimentation or erosion impacts in the surrounding landscape, where practical.

4.7.4 Data collection

Lizard capture data will include species identity, sex, length, and any tail regeneration. Each stage of salvage will be recorded, including start/stop time, GPS coordinates, and a habitat description for the capture location, date and time. Weather conditions will be recorded during and at the beginning and end of each salvage event.

4.8 Additional compensation (if required)

4.8.1 Overview

It is generally acknowledged by New Zealand herpetologists that the impacts of predator control on lizards are unknown, and that predator control activities may have a detrimental impact on some lizard species (i.e. Tautuku gecko and green skink) long-term if only a select guild of predators are controlled (i.e. if only some mustelid species and rats are controlled, this may result in predator release of smaller bodied species which are most likely to impact lizard and invertebrate populations, such as weasels and mice (Haworth, 2018)). In this regard, the predator control program outlined in the HREP may not be sufficient to fully address the potential loss of individual lizards not captured and relocated during the salvage and supervised clearance work, because predator control for arboreal geckos and large bodied skinks is largely experimental. Therefore, additional compensation will be required if species additional to tussock skink, herbfield skink and Tautuku gecko are discovered (road or turbine).

4.8.2 Green skink

In the unlikely event that **green skink are discovered on site**, additional compensation will be provided to address the residual effects on green skink. Compensation will comprise the installation of a predator proof fence at a site with a known population of green skinks[1]. The predator proof fence will enable green skinks to be protected long term and prevent the further decline of this species, and account for any residual effects to green skink at the Wind Farm Site.

The implementation and construction of the fence will be facilitated by Contact Energy in collaboration with DOC. This may include biosecurity and upkeep of the fence for the life of the consent. The fence particulars (including cost, size and maintenance requirements) will be determined in consultation with DOC if a green skink is discovered in accordance with the consent conditions.

4.9 Risks associated with proposed management

Potential risks to lizards as a result of the proposed salvage, and the management actions to reduce these risks, include:

- **Overheating**
  - Issue: Overheating may occur when captured lizards are temporarily held in containers during ongoing salvage activities.
  - Action: Lizards will be placed in individual containers and kept in a cool place until transported and released. Handling will be minimised to ensure they do not become stressed. All traps will be checked daily, and preferably in the afternoon.
- **Overcrowding**, **displacement and competition**
  - Issue: It is likely that any population of lizard within the habitat at the Wind Farm Site is under some pressure from predation and is therefore at the site's current carrying capacity. This is likely to be the same at the release site.
  - Action: Lizards will be released into appropriate habitat for each species within the release site. The release sites will be enhanced with predator control and habitat units.
  - Action: Any green or herbfield skink detected will be released into a fenced area at the Copper Tussock Enhancement and Skink Protection Area.
  - Action: All Tautuku gecko will be released into existing TACOs within the release pen.
- **Injury/death**
  - Issue: Incorrect trapping or handling during salvage by untrained staff.
  - Action: All lizards will be captured or supervised by an appropriately qualified ecologist, following best practice and full hygiene protocols, minimising the risk of injury, death and disease transmission through inappropriate handling and capture.
  - Issue: Release pen/leaky fence is damaged by deer/pigs and lizards are no longer protected.
  - Action: The Tautuku gecko release pen will be checked regularly to ensure that it does not become damaged, or is repaired sufficiently following any damage.
  - Action: Fence checks will be undertaken monthly in winter (June-August) at the green skink leaky fence, to manage any effects from large snow falls.

[1] Bare Hill Conservation Area is known to have the biggest population of green skink, and should be considered.

5.0 Release Site and Onsite Compensation Locations

5.1 Overview

Three release sites have been selected for the species impacted at the Wind Farm Site. Two sites have been selected for tussock skink (Matariki and Jedburgh; Section 5.2) and one for Tautuku gecko (Jedburgh; Section 5.4). In the unlikely event that green or herbfield skink are detected, a leaky fence will be constructed for these two species within one of the tussock skink release areas (Section 5.3).

Prior to the commencement of the implementation of pest control at the lizard release areas, consultation will be undertaken with the Department of Conservation (Invercargill Office) on the pest control methods that will be implemented to ensure they not directly or secondarily affect lizards (in accordance with Condition EC57A).

The DOC translocation recommendations (DOC, 2018) and recent research (Lettink, M. 2023 SRARNZ Conference) suggests that at least five to ten years of monitoring is required prior to and following a translocation to understand the lizard species abundance and distribution as well as response to predator control. This is not possible for this Project due to time constraints. However, preliminary surveys for tussock skink have been undertaken at both release sites proposed to ensure this species is present, and baseline surveys will be undertaken prior to release of salvaged skinks. It is unlikely that Tautuku gecko are present in the nominated release site for this species.

5.2 Tussock skinks

Tussock skink release sites have been chosen to reflect species habitat requirements and follow the guidance provided by DOC (2019). There are two main release sites at Jedburgh Station and Matariki Forest:

(i) The Jedburgh release site (Jedburgh Skink Protection Area) is adjacent to the Wind Farm Site road access between JED-28 and JED-29, where tussock skinks have been previously captured (Figure 3).

(ii) The Matariki Forest release site will be situated in the Copper Tussock Enhancement and Skink Protection Area between MAT-09 and MAT-10 (Figure 3).

The following habitat restoration and enhancement measures will be undertaken in order to benefit relocated lizards:

- Removal of livestock and ungulate control as part of the broader restoration effort;
- Deployment of felled coarse woody debris (decaying or felled logs) that have been salvaged from the Project footprint;
- Control of pest plant species such as gorse and wilding conifers (at the Copper Tussock Enhancement and Skink Protection Area, which would add additional lizard habitat); and
- Pest management to control introduced predatory mammals (including targeted control of mice) as detailed in the HREP. Pest control within the relocation site will complement the broader pest control programme to provide an opportunity for relocated lizards to establish, and will be undertaken following best practice, to ensure that methods do not affect lizards through primary or secondary poisoning. Pest control within the two skink relocation sites will be undertaken by a nominated contractor and shall include:
  - Targeting of rats and **mice** via toxic baiting across a bait station grid network, which will be undertaken prior to, during and for a minimum period of five years after lizard relocation operations cease.
  - Reduction targets are <5% tracking tunnel index (TTI) for rats and < 10% TTI for mice.
  - The programme will commence before salvage and relocation occurs, in order to aim to meet the reduction targets. Monitoring of lizards at the release site will be undertaken during this time to determine the response from lizards to predator control (see Section 6.1.5).

- Methodologies to achieve the above targets in terms of baiting frequency, bait station density/ha and bait type will be determined by the nominated contractor.
- If a subsequent tracking tunnel monitoring round shows that rat or mice presence is above 10%, an additional control operation must be carried out within two weeks.

Additional methods and timeframes are detailed in the HREP.

5.2.1 Deployment of felled coarse woody debris (Jedburgh release site only)

Where possible, coarse woody debris will be removed immediately following clearance and deployed within the closest release site. As much coarse woody debris as possible will be removed by the permitted herpetologist or vegetation removal contractors and placed inside the release areas under guidance of the project herpetologist. Refer to the VMP regarding coarse woody debris management. The deployment of coarse woody debris into the release site is not essential to releasing lizards into the release sites immediately, as it is assumed that predator control will initially result in increased carrying capacity at the site.

5.3 Herbfield and green skink

5.3.1 Leaky fence - Copper Tussock Enhancement and Skink Protection Area

A 'leaky' fence aims to keep the target species inside whilst keeping out the majority of mammalian predators, which is especially important for Threatened species, such as green skink (if present). Leaky fences are used widely in lizard conservation throughout New Zealand. The leaky fence will be constructed within the Copper Tussock Enhancement and Skink Protection Area (Figure 3). The fence will be 0.5 hectares in area, allowing for a small number of **green or herbfield skinks** that may potentially be salvaged at MAT 9 and 10 (the key sites anticipated to have the species) and incidental discoveries. **If no herbfield or green skinks are detected** following the completion of vegetation clearance and salvage activities at MAT-9 and MAT-10, any salvaged tussock skinks may be released into the leaky fence.

5.3.2 Construction

The fence will be constructed using 1.5-millimetre thick, smooth, high-density polyethylene (HDPE) geomembrane material to ensure that it cannot be climbed by skinks or mammalian predators. The fence will be 700 millimetres tall and have a skirt that extends 100 millimetres vertically and 200 millimetres horizontally into the ground. This fence height should exclude hedgehogs and most rodents and deter other mammalian predators.

The fence will be installed by a nominated contractor following the advice of, or supervision from, the Project Herpetologist.

5.3.3 Maintenance and monitoring

Fence maintenance and monitoring will be undertaken **once every three months for a year post lizard release** by a suitably qualified contractor. The assessment will include checks for any deformities in the fence, including holes, breaks, missing bolts etc. Monitoring frequency will increase to monthly over winter, to allow for any heavy snow events[1]. In addition, the grass/vegetation on either side of the fence will be assessed. If the vegetation is 500 millimetres or similar in height a one-metre-wide section on both sides of the fence should be cut to 200 millimetres high in a lizard friendly manner (i.e., by hand, or a weed eater only if necessary) to ensure lizards cannot escape the fence, and to deter predators. By cutting the vegetation to this height the direct disturbance to lizards should be minimal.

[1] Or the fence will be checked immediately following a large snow event, when reported.

5.3.4 Removal

If no herbfield or green skink are captured during lizard salvage and pre-clearance checks, following construction of MAT-10 and the completion of skink salvage at all sites, the leaky fence will be removed after twelve months.

If green skink are captured and released into the leaky fence, the **leaky fence will remain in place for the duration of the operation of the Southland Wind Farm**.

5.4 Tautuku gecko

5.4.1 Release pen

Tautuku gecko will be released into a dedicated release pen within the Jedburgh Station Ecological Enhancement Area (Figure 3). TACOs will be set up within the release pen to allow for safe release.

The construction of the release pen will commence three to six months prior to salvage and relocation of lizards (i.e. prior to the vegetation clearance in the areas where Tautuku gecko have been confirmed to be present or considered likely to be present). The construction methodology will follow DOC, 2017[1] (Appendix 5), and the pen will be fenced with black polythene plastic[2]. An area within the site has been selected to be suitable, which is comprised primarily of mānuka scrub and forest within the 245-hectare Jedburgh Station Ecological Enhancement Area.

It is unlikely that the release pen will have a detrimental impact on the resident population as resident geckos are unlikely to be present in high numbers (*if at all*) due to separation from existing habitats, and gradual regeneration at the site.

The release pen will be approximately 2.6 hectares in size (*c.*800 metres of fencing required). Preparation will include the addition of logs from the construction footprint where practicable[3], and the time between construction and the release of the first geckos will allow plants to recover from grazing. The fence will be constructed around a discrete area of mānuka treeland, using the canopy edge and existing farm track to guide pen placement. TACOs will be installed on mānuka trees within the site to provide additional cover for Tautuku gecko once released.

5.4.2 Timeframe, monitoring and removal

The release pen will be in place for at least three months before any Tautuku gecko are released within it[4], and will be removed one year following the last transfer of geckos to the pen (beyond the minimum time thought to be suitable; DOC 2017). Monthly checks of the release pen will be undertaken to ensure it does not fall into disrepair or become damaged, until the ungulate exclusion fence is constructed. Following salvage, checks of the pen will decrease to two-monthly for the duration of the pen.

TACO monitoring will be undertaken once in summer, once in autumn, once over winter and once in spring prior to removal of the pen (six times total, following release). Following removal of the pen, monitoring will be undertaken yearly for five years (see Section 6.1). Monitoring will aim to recapture salvaged individuals and collect information on their health and dispersal following translocation.

[1] Although written for green geckos, the guidelines are applicable for most arboreal geckos.

[2] Black Polythene Rolls - Film Products - Ipak Internet Packaging https://www.ipak.co.nz/shop/Polythene+Range/Black+-+General.html?gclid=CjwKEAjwxeq9BRDDh4_MheOnvAESJABZ4VTqPHRYVQLx2dJnFVrq8d6KW8iZBpmTeecQxmIYxc7KxxoCBsXw_wcB

[3] Some trees may require trimming to create sufficient space between the release pen and the existing habitats outside the pen. In addition, it is possible that unsupervised vegetation clearance will be occurring within the Wind Farm Site, outside of lizard habitats and this vegetation could be used to supplement habitat within the release pen.

[4] To allow for predator control to commence.

5.4.3 Mammalian predator management

Mammalian predator management within the Tautuku gecko release pen will be undertaken by a nominated contractor contracted by Contact Energy. A detailed mammalian predator management and monitoring plan is described above, and in the HREP, but is adjusted for the soft release pen in order to knock-down mice.

Mammalian predator control within the soft release pen will involve intensive control undertaken prior to, during, and following lizard relocation operations, for at least six months. This will include:

- Intensive toxic baiting of rats and mice across a bait station grid network.
- Less intensive control will be undertaken for at least one year following intensive initial control:
  - Periodic toxic baiting of rats and mice in response to monitoring.
  - DOC150 traps for hedgehog control and eradication within release pen.

Mammalian predator monitoring will involve tracking tunnel surveys for rats and mice[1].

Mammalian predator management goals are as follows:

- <5% tracking tunnel index (TTI) for rats (with a threshold of ≥ 10 % requiring further management to be implemented).
- <10% TTI for mice (with a threshold of ≥ 15 % requiring further management to be implemented).

[1] Four tracking tunnels per release site, with surveys run twice per year.

contact

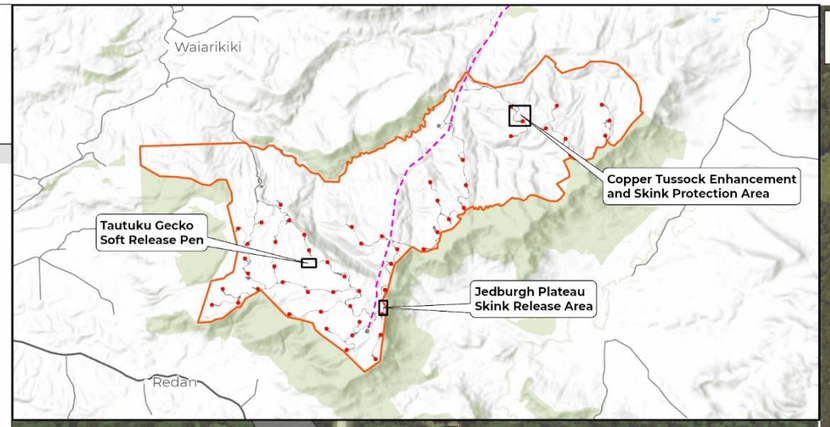
LEGEND

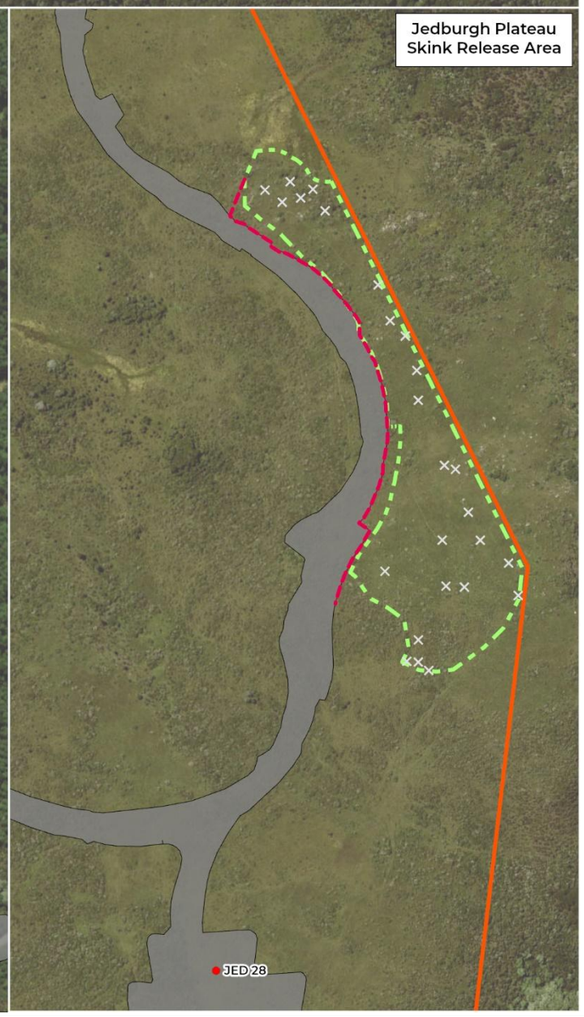
Wind Farm

- Wind Turbines
- Transmission Line Route
- Civil Works Design
- Wind Farm Site

Release Sites

- Post release monitoring traps
- Indicative Barrier Fence
- Tautuku Gecko Soft Release Pen
- Jedburgh Plateau Skink Release Area
- Skink Soft Release Pen
- Copper Tussock Enhancement and Skink Protection Area (c. 8 ha)





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CREDITS:

Wildlands
Ecological data provided by Wildlands Consultants

TITLE

FIGURE LMP - 3

SKINK AND TAUTUKU GECKO RELEASE SITES

Table 10 below addresses the criteria for consideration of a site for lizard release (based on Principles 6, 7, and 9 of the lizard mitigation guidelines prepared by DOC).

Table 10 – Assessment of lizard release sites based on Principle 6 of the lizard salvage guidelines (DOC, 2019).

Principle relating to salvage and release	Description	Detail/Activity
1. The site must be ecologically appropriate and have long-term security	**Resident lizard communities must be understood** *Will released lizards increase viability of population, or be released in high enough numbers to start new population?*	Lizard surveys were carried out at both sites in 2023 and 2024. **Tussock skink** was confirmed present at both sites, therefore appropriate for the species salvaged. Baseline monitoring at the release sites will determine the population viability at the site. The **Tautuku gecko** release pen is south of the JED21 site, which has the highest number of Tautuku gecko observations to date. It is unlikely Tautuku gecko are present within the site, or if they are, they will be at very low levels. It is anticipated that enough geckos will be transferred to the pen to begin a new population, or disperse back into the surrounding area which is adjacent to known populations of gecko.
	The release site must be an appropriate distance from the impact site to prevent lizard homing, but close enough that it provides similar habitat.	Fencing will be installed prior to clearance of the impact sites nearest to the release sites to ensure a barrier is present between the release site and the impact site. A buffer of 10 metres between the JED-29 access road and the Jedburgh release site will be created to prevent disturbance from earthworks. Tautuku gecko release pen will be within the wider habitat available for the species, but located a safe enough distance to prevent homing, and will be penned which will prevent dispersal and aid territory establishment.
	The location must be within the species natural geographic range. *Ensure no mixing of potentially genetically structured populations.*	All sites fall within the Wind Farm Site, and are therefore within the species natural geographic range.
2. The habitat at the site must be suitable for the salvaged species	**Vegetation composition and size:** predominantly indigenous vegetation and sufficiently large and continuous for residents, release lizards and allowing for population growth.	**Matariki Forest** skink release site is primarily copper tussock grassland and is suitable for the species. There is sufficient opportunity to create more habitat through ongoing pest plant control. **Jedburgh** skink release site: the site is primarily indigenous herbfield and grassland. There is likely to be opportunity to enhance these habitats through the placement of coarse woody debris from vegetation clearance. Woody debris will be placed at 5 metre spacings throughout the release site. **Tautuku gecko** release pen is suitable as the release pen will be situated within manuka forest habitat, adjacent to known populations, which is likely to regenerate over time into a diverse habitat for the species.
	Must contain sufficient resources for potential population. For example, food, cover, retreats. What enhancements are proposed for expanded population?	Coarse woody debris will be removed from the impact site and placed within the release sites to provide additional habitat for released lizards. If Tautuku gecko will be placed within a TACO in the release pen. these will be left within the release area to provide additional refugia. Predator control will also be undertaken, which is likely to increase food availability.

Principle relating to salvage and release	Description	Detail/Activity
	Habitat enhancement – must be ongoing in an ecologically relevant timeframe.	Habitat enhancement will be undertaken as per the HREP, and at each release site, at least one of the following will occur: • Pest plant control • Targeted predator control • Placement of coarse woody debris, or rocks excavated from the Jedburgh skink release site. In addition, the Matariki Forest release site will be fenced with a deer fence in order to protect from future disturbance from ungulate browse and trampling.
3. The site must provide protection from predators	*Habitat must protect from predators, or effective pest control must be in place. Must include full suite of predators including targeted control of mice.*	Predator control will be undertaken as part of the HREP. Predator control will be undertaken for at least five years and control rodents.
4. The site must be protected from future human disturbance	*Land tenure must ensure long term protection from disturbance.*	The Matariki Forest Copper Tussock Enhancement and Skink Protection Area (of which the skink release area is located within) will be fenced with a deer fence in order to protect from future disturbance.

5.5 Release methods

5.5.1 Skinks

All tussock skinks collected either during salvage, pre-clearance checks, or incidental discoveries (if nearby to release sites), will be transported to the closest release site (Figure 3). The two release sites for tussock skink are located at:

- Matariki Forest (Copper Tussock Enhancement and Skink Protection Area) (between MAT-09 and MAT-10).
- Jedburgh Station (Jedburgh Skink Protection Area) (adjacent to JED-28 and JED-29).

Tussock skinks will be released into woody debris, or under rocks individually, or if captured in groups, released together. Release points will be five metres apart.

Green or herbfield skink if discovered will be released into the release site at the Copper Tussock Enhancement and Skink Protection Area. Skinks will be released into the base of flax or tussock approximately five metres apart.

5.5.2 Geckos

All Tautuku gecko discovered during pre-clearance checks, salvage and during vegetation clearance will be captured and released into TACOs which have been installed inside the release pen (within the Jedburgh Station Ecological Enhancement Area). If captures exceed the number of TACOs, additional TACOs will be installed, or if no trees are considered suitable, geckos will be released into trees with loose bark and cavities, away from any other released geckos. If captured in the same tree, or TACO, geckos will be released together, or as close as practically possible. Any Tautuku gecko encountered following the Incidental Discovery Protocol (Appendix 4), will be reported to the Project Herpetologist, who will decide on its release.

5.5.3 Transportation of lizards

All captured lizards will be temporarily placed in clean individual cloth bags, and stored in ventilated, hard-sided containers (to prevent accidental crushing), in full shade. A small amount of damp leaf litter or vegetation from the capture site will be placed inside the cloth bags with the lizard to provide cover and prevent dehydration. Any lizards captured will be handled and held following best practice and released as soon as practical to the pre-selected lizard release area. Lizards will be released within five hours of capture into the pre-selected release area.

5.5.4 Changes to lizard management implementation (if required)

Notable changes to *salvage and relocation protocols* will be undertaken in consultation with Contact Energy, Southland District Council, DOC, other territorial authorities, iwi project partners, and/or stakeholders (as required). Resulting changes and updates to the LMP, following consultations, will be effective upon confirmation with all respective groups.

6.0 Monitoring

6.1 Post-release monitoring

6.1.1 Overview

It is widely acknowledged that lizard management and salvage related activities are not well reported or very successful. DOC Lizard Salvage Guidelines (DOC, 2019) recommend monitoring to evaluate the success of the salvage operation. However, post-release monitoring for low density arboreal species (such as Tautuku gecko) in tall vegetation is difficult and may not be worthwhile, as it will not be possible to estimate survival and there will be limited learnings from salvaging a small number of lizards. As such, monitoring following completion of salvage work will only be required for a species if **20 or more** individuals of that species are relocated.

Monitoring requires clear objectives to be set prior to initiation of development activities and an appropriate level of monitoring is essential to determine whether any changes to lizard management might be required (DOC 2023).

Due to the low numbers of Tautuku gecko observed during surveys as well as the fact that they are unlikely to be present at the Tautuku gecko release area, no baseline surveys will be undertaken within the release pen. However, a database of salvaged geckos will be kept to ensure that any new individuals are recorded, if found within the release area.

6.1.2 Duration

Monitoring will be undertaken over four days at both release sites yearly for a minimum of **five** years, beginning in the first available lizard season, post release.

6.1.3 Objectives

The purpose of monitoring is to ensure the success of the salvage from the Wind Farm Site to the release site. The objectives for monitoring at the release site are as follows:

Objective 1: Monitor population persistence of the released lizard population, post release

Objective 2: Ensure enhancement in the release sites (see HREP for more detail).

- Monitor effectiveness of weed control.

Objective 3: Reduce pest mammal presence with the release site.

- Monitor and control (where necessary) pest mammals as per the HREP.

6.1.4 Objective 1 – lizard population persistence

Tussock skinks

Post-release monitoring may not detect any changes in the population of any lizards in the short term and may need to be carried out for up to **five** years (DOC, 2019). Therefore, lizard post-release monitoring will be established at the release site during the first lizard active season post salvage and will be undertaken by a suitably qualified ecologist annually for five years.

Baseline surveys

Baseline (pre-release) surveys will be carried out in the release sites for tussock skinks, and if the requirement for post-release monitoring is triggered, the monitoring will continue following release of salvaged lizards.

To gain a robust dataset for occupancy modelling, a baseline survey of the release sites will be undertaken prior to salvage. This will give an indication of the baseline population at the site, prior to release. A grid of 50 pitfall traps will be installed at the release site within the Copper Tussock Enhancement and Skink Protection Area and two grids containing 25 traps within the Jedburgh Skink Protection Area will be installed at least one week prior to the baseline survey. A smaller grid of 25 pitfall traps will be installed within the leaky fence at the Copper Tussock Enhancement and Skink Protection Area. Pitfall traps will be set at 5-10 metres apart and as described in Section 4.4.2 and Figure 3. Once the survey has been completed, the pitfall traps will be closed, but will remain in situ. Baseline surveys will be undertaken during the summer prior to works commencing at the Wind Farm Site.

Post-release monitoring if more than 20 individuals salvaged

Monitoring of translocated individuals for survivorship and establishment is not practical without toe-clipping for this species, as they cannot be reliably identified at an individual level from their natural markings. However, this method will not be used as it is widely considered unethical. Therefore, the design of the post-translocation monitoring work (if required) will be focussed on assessing population persistence at the site following relocation. Mark-recapture during the monitoring period is possible, and occupancy modelling can be conducted to estimate the size of the population, and trends of persistance over time, which can provide an indication of how lizards are faring at the site. Post-release monitoring will consist of a mark-recapture live capture survey over one week during fine weather between November and February annually. Captured lizards will be temporarily marked to determine recapture rates. Permanent grids will need to be micro-sited to avoid areas of gorse (Figure 3 provides indicative monitoring sites). Each trap will be marked with a bamboo stake and flagging tape.

Numbers detected during each monitoring session can be compared over time to provide some indication as to how skinks are faring at the site. These methods will not provide accurate estimates of population size or trends over time. However, these methods will determine skink persistence at each pile, and can inform the ongoing management prescribed for the site.

Tautuku gecko

If more than twenty Tautuku gecko are relocated, TACO monitoring will be undertaken once in summer, once in autumn, once over winter and once in spring prior to removal of the pen (six times total, following release). Following removal of the pen, monitoring will be undertaken yearly for **ten** years. Monitoring will aim to recapture salvaged individuals and collect information on their health and dispersal following translocation. It is expected that Tautuku geckos will disperse out of the release site area over time following deconstruction of the pen. Monitoring will be undertaken at the same time as monitoring outside the release pen.

6.1.5 Objective 2 – reduction of pest mammals

Monitoring

Baseline pest monitoring is required prior to mammalian pest control to customise and refine the approach based on actual data on pest animal densities with which to benchmark results and outcomes (HREP). Reduction target monitoring using standard methodologies will be undertaken to verify that reduction targets have been achieved for target species. At the release sites this includes:

- Tracking Tunnel Indices (TTI) for rats and mice.
- Residual Trap Catch (RTC) for possums and mustelids.

6.1.6 Herbfield or green skink

If relocated, it will be unlikely that herbfield skink or green skink will be redetected during monitoring, due to the extremely low numbers expected. However, they can be identified to an individual level due to their unique markings. Therefore, any incidental observations and counts will be recorded for these species and their identities captured to check for survivorship if detected during tussock skink monitoring.

6.2 Tautuku gecko monitoring within Jedburgh Station Pest Control Area

If more than 20 Tautuku gecko are found during salvage, monitoring within Tautuku gecko habitats within the Wind Farm Site is required to determine the species response to predator control within the Jedburgh Station Pest Control Area. Monitoring will be undertaken to determine predator control impacts on the species within the Jedburgh Station Pest Control Area. The aim follows the assumption that long-term predator control may trigger increased detectability of Tautuku gecko.

TACOs will be installed in 200 metre long transects (with a maximum of five transects) on sunny faced tree trunks, adjacent to where geckos were detected during site surveys and where possible, using devices previously installed during baseline surveys. TACOS will be checked once a year in fine weather, for **ten** years. The exact methods of data collection and precise monitoring locations (within the Jedburgh Station Pest Control Area) will be determined by a suitably qualified herpetologist.

6.3 Data collection

All lizards captured will be measured (snout-vent length, tail-vent length, regen length), sexed, photographed and marked with an ID number.

6.4 Contingencies

6.4.1 Overview

Due to the scale of the development and the number of species that may potentially be present, contingencies have to be addressed to ensure that all risks to lizards are considered appropriately. Potential risks and contingencies are listed in Table 11 below.

Table 11 – Risks associated with salvage and proposed management.

Risk Associated with Management	Detail	Contingency
More lizards than expected during salvage	More than estimated tussock skink (see Table 6).	Continue trapping for seven days, with an additional three days until one skink or less is caught on one day, at the discretion of the Project Herpetologist.
	More than **100** Tautuku gecko (it is not possible to estimate how many geckos may be recovered due to the structure of habitats and survey methods for this species).	Site wide monitoring to be extended for **ten** years.
		Additional geckos may need to be released outside of the release pen, into the 245-ha Jedburgh Station Ecological Enhancement Area.
Additional species encountered	It is possible that herbfield skink and green skink may be discovered during vegetation clearance and earthworks.	A leaky fence design pen will be constructed within the Copper Tussock Enhancement and Skink Protection Area for herbfield and green skink, if they are discovered (Section 5.2.2).
	Herbfield skink	Follow salvage guidelines for tussock skink, additional three days of salvage required.
	Green skink	Stop works, notify DOC. Release into leaky fence pen area at Copper Tussock Enhancement and Skink Protection Area release site.
		Additional compensation towards a predator proof fence to account for residual effects to green skink. Contact Energy will work with DOC to arrange this work.
		Leaky fence will be monitored and maintained for the life of the consent (Section 5.3.3).
	Any other species	Stop works, notify DOC.
Release site failures	Any release pen/leaky fence is damaged prior to construction of pig and deer exclusion fence.	Checks will be undertaken until ungulate fence is constructed, or fence is decommissioned. These are likely to be undertaken during gecko release. Repairs will be undertaken immediately following fence checks, on an as required basis.
	Tautuku gecko release pen is damaged following construction of the pig and deer exclusion fence.	Six monthly checks will be undertaken until the pen is removed (following last Tautuku gecko salvage and release). These are likely to be undertaken during lizard release and monitoring. The release pen will be checked more regularly in winter to reduce risk of failure during snowfall events. Repairs will be undertaken immediately following fence checks, on an as required basis.
	Monitoring detects negative occupancy trends.	Determine cause for negative trends (see Section 0). Review and discuss with DOC and Contact.
	Predator numbers increase	Follow guidance in HREP and reduce predator numbers to required rates (Section 6.4.3; Section 9.3 HREP).

6.4.2 Monitoring detects negative occupancy trends

Tautuku gecko

If capture rates are determined to be declining, or body condition of geckos declines during the initial lizard monitoring period at the release site, the following actions will be taken:

1. Follow-up monitoring within the same season to determine if the survey was anomalous (for capture declines).
    a. If monitoring reveals the same trend;
        i. Post-release monitoring will continue for another **two seasons** to determine if (any) management interventions are required. These interventions will be determined in consultation with Contact Energy and DOC, on an as required basis, based on point 1, and 1a. Management interventions may include:
            1. Adapted predator control, or increased habitat enhancement.
            2. A review of predator control success, and habitat enhancement.
    b. If repeat monitoring shows anomaly, continue as per normal.
2. For gecko body condition declines, monitoring will decrease to yearly, and records will be taken for geckos that lose condition.
    a. Notify DOC if declines continue for further advice.

6.4.3 Predator numbers increase within the release sites

If a subsequent tracking tunnel monitoring round shows that rat or mice presence is above 10%, an additional control operation must be carried out within two weeks. Further, control operations may need to consider the adaptive use of poisons to reflect changes in uptake and preference by predators (as described in Section 9.3; HREP).

7.0 Reporting

7.1 Geotechnical investigations

A report will be delivered to SDC, DOC and mana whenua one month following the implementation of any management measures for geotechnical investigations, as outlined in Section 4.2.

7.2 Compliance

A compliance monitoring report will be submitted annually during construction to Southland District Council, DOC, and mana whenua (reporting period will be from 1 July to 30 June, provided by 30 September, annually).

This report shall include:

- Confirmation that lizard salvaging and relocation operations were undertaken in accordance with the LMP and associated consent conditions;
- Salvage and relocation results;
- Relocation site pest monitoring results to verify that pest reduction targets have been met and that pest control protocols have been adhered to;
- Results of monitoring at the release sites; and
- Recommendations for potential changes to improve the effectiveness of lizard management in relation to the LMP scope.

The compliance monitoring report shall also include representative photos showing:

- The salvaging methodologies; and
- Captured lizards, including both salvage and relocation site photos.

7.3 Wildlife Act Authority

Reporting requirements outlined in the WAA will be adhered to. Lizard capture and relocation data will also be compiled, summarised and submitted to the DOC Bioweb Herpetofauna database annually. As a minimum, the report will include the following information:

- DOC Wildlife Act Authority number and Project name and location;
- A summary of the species, numbers and age/sex classes of lizards captured;
- Locations of lizards captured; and
- Summary of salvage methodologies, effort and success.

7.4 Monitoring report

Annual reporting will continue for as long as annual monitoring is required, following the completion of salvage. A final report summarising the outcomes of LMP implementation will then be prepared and submitted to Southland District Council, DOC, and mana whenua following the end of lizard management, which is dependent on the timing of salvage completion.

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Appendix 1

Lizard survey results 2022-23

Habitat types

Tussock skinks were recorded in the following vegetation types in the Wind Farm Site:

- Rank grassland beside forestry tracks (not mapped).
- Copper tussock grassland.
- [Mānuka-gorse]/copper tussock grassland.

Tracking Tunnels

Skink prints were detected in six tracking tunnels (9.2% of tunnels) that were in place from 21 December 2022 to 27 January 2023 (Figures 1a, 1b; Table 11). Skink prints were detected in an additional two tracking tunnels during the ACO survey in April 2023 (12.3% of tunnels, *c.*16 weeks following set up). Skink prints were detected in two tracking tunnels at Jedburgh Station and six tracking tunnels at Matariki Forest.

Table 12 – Lizard survey effort and weather conditions in the Wind Farm Site during the April 2023 survey.

Date	Weather	Activity and effort	Species detected
13/04/23	Cold, low cloud, mist, southeast wind. Wet foliage. 9.9-10.4 degrees, 87.3 – 79.2 % relative humidity	Matariki and Jedburgh: ACO checks @ 138 checks.	1 × tussock skink
14/04/23	Sun, strong wind and patchy cloud.10-17.3 degrees, 84.8 – 72.8 % relative humidity	Matariki and Jedburgh: ACO checks @ 138 checks.	3 × tussock skink
15/04/23	Sunny, warm-hot, slight breeze, no cloud, 14-15 degrees. Spotlighting conditions: cool, no cloud, 8-10 degrees.	Matariki and Jedburgh: ACO checks @ 138 checks. 2 person hours spotlighting.	1 × tussock skink
16/04/23	Sunny, warm-hot, slight breeze, no cloud, 15-16 degrees. Spotlighting conditions: cool-cold, minimal cloud, 6-7 degrees.	Jedburgh (minus JED-32): ACO checks @ 90 checks. 2 person hours spotlighting.	Nothing detected
17/04/23	Cloudy with intermittent periods of sun, cool, light wind, 12-14 degrees.	Matariki (plus JED-32): ACO checks @ 48 checks.	Nothing detected

ACOs

Five tussock skinks (Plate 1) were detected under ACOs during the survey in April 2023 - three at Jedburgh Station and two at Matariki Forest (Figures 1a, 1b; Table 11). This represents detections in 3.6% of the ACO's deployed. No other species were detected during the survey.

Spotlighting

No lizards were detected during spotlighting.

Appendix 2

Lizard survey results 2024

Table 13 – Lizard survey effort and weather conditions at the site during in 2024.

Date	Weather on survey date	Site	Activity and effort	Species detected
February 2024				
12-02-24	Overcast, light breeze, 13.7-15.9°C, 75.3-53.2% r.h.	Matariki	• 136 ACOs checked • 25 Funnel traps installed	13 tussock skinks
		Jedburgh	• 231 ACOs checked	3 tussock skinks
13-02-24	Sunny with partial cloud, light breeze to light wind, 15-19.1°C, 65-56.2% r.h.	Matariki	• 136 ACOs checked • 25 Funneltraps checked	8 tussock skinks
		Jedburgh	• 231 ACOs checked	1 tussock skink
14-02-24	Sunny, very light breeze, 20.5-23°C, 52.2-45.9% r.h.	Matariki	• 136 ACOs checked • 25 Funneltraps checked	8 tussock skinks
		Jedburgh	• 231 ACOs checked	Nothing detected
15-02-24	Overcast, rain, light breeze, 11°C, 91.3% r.h.	Matariki	• 25 Funnel traps checked	7 tussock skinks
		Jedburgh	• 231 ACOs checked	Nothing detected
16-02-24	Sunny, light breeze, 15.9-19.3°C, 67-62.3% r.h.	Matariki	• 136 ACOs checked • 25 Funnel traps checked and collected	3 tussock skinks
		Jedburgh	• 231 ACOs checked	Nothing detected
April 2024				
05-04-24	Overcast, fog and intermittent light rain, light wind, 9.4-10.2°C, 88-85% r.h.	Matariki	• Set 14 Funnel traps at MAT-16	Nothing detected
		Jedburgh	• 28 TACOs checked	Nothing detected
06-04-24	Overcast, fog and intermittent light rain, light wind, 9.7-13°C, 97-86% r.h.	Matariki	• 14 Funnel traps checked • 14 ACOs checked.	Nothing detected
		Jedburgh	• 56 TACOs checked	Nothing detected
07-04-24	Overcast, fog and intermittent light drizzle, light breeze, 11.2-11°C, 100% r.h.	Matariki	• 14 Funnel traps checked	Nothing detected
		Jedburgh	• 10 ACOs checked • 49 TACOs checked	Nothing detected
08-04-24	Sunny, light breeze, 17-19°C, 79-77.2% r.h.	Matariki	• 14 Funnel traps checked. • 14 ACOs checked.	Nothing detected
		Jedburgh	• 56 TACOs checked.	Nothing detected
09-04-24	Overcast, light wind, 13.6-15°C, 77.5% r.h.	Matariki	• Check and remove 14 Funnel traps.	Nothing detected
Total			**131 funnel trap checks** **189 TACO checks** **1,737 ACO checks**	**43 tussock skinks, no recaptures**

Appendix 3

Lizard survey results 2025

Date	Weather on survey date	Location, activity & effort	Species detected
16-02-25	Sunny, moderate W wind, 25.6°C, 35.8% r.h. - 26.5°C, 39.8% r.h.	JED06: 20 TACO checks.	Nothing detected.
		JED20-21: 91 TACO checks.	**1 Tautuku gecko observed at ACO 43**
17-02-25	Sunny, calm, 23.1°C, 68.1% r.h. - 23.1°C, 62.0% r.h.	JED33-34: 64 TACO checks.	**1 Tautuku gecko caught at ACO 84**
		JED29-30: 19 TACO checks.	Nothing detected.
18-02-25	Overcast, SE breeze, 16.7°C, 86.5% r.h. - 20.5°C, 78.8% r.h.	JED06: 20 TACO checks.	Nothing detected.
		JED20-21: 91 TACO checks	Nothing detected.
19-02-25	Overcast/fog, moderate S wind, 15.2°C, 98.8% r.h. - 15.7°C, 97.9% r.h.	JED33-34: 64 TACO checks.	Nothing detected.
		JED29-30: 19 TACO checks.	Nothing detected.
23-02-25	Overcast, light E wind, 17.9°C, 58.9% r.h. - 16.0°C, 60.6% r.h.	JED06: 20 TACO checks.	Nothing detected.
		JED20-21: 91 TACO checks.	**1 Tautuku gecko caught at ACO 3**
24-02-25	Sunny, calm, 19.1°C, 55.4% r.h. - 24.5°C, 49.7% r.h.	JED33-34: 64 TACO checks.	Nothing detected.
		JED29-30: 19 TACO checks.	Nothing detected.
26-02-25	Overcast, drizzle, moderate SW wind, 9.9°C, 76.4% r.h. - 16.0°C, 65.9% r.h.	JED06: 20 TACO checks.	Nothing detected.
		JED20-21: 91 TACO checks.	Nothing detected.
27-02-25	Overcast, sunny periods throughout day, light-moderate W wind, 16.8C 70.9%r.h - 19.8C, 52.5%	JED33-34: 64 TACO checks.	Nothing detected.
		JED29-30: 19 TACO checks.	Nothing detected.
2-04-25	Sunny, warm, moderate wind, 16.6°C-14.2°C, 77%-79% r.h.	JED29-30: 19 TACO checks.	Nothing detected.
		JED06: 20 TACO checks.	Nothing detected.
		JED33-34: 64 TACO checks.	Nothing detected.
2-04-25	Cool, moderate wind, short period of very light drizzle, 12.2°C-12°C, 83%-83.2% r.h.	JED20-21: 4 person hours spotlighting.	Nothing detected.
		Incidental ground ACO checks.	Tussock skink detected ACO 7.
3-04-25	Sunny with partial cloud, warm, light breeze, 19.7°C-19.5°C, 73.6%-71% r.h.	JED20-21: 91 TACO checks.	**1 Tautuku gecko caught in ACO 76**
3-04-25	Warm, light wind, 17.8°C-17.1°C, 73.5%-73.1% r.h.	JED21: 3 person hours spotlighting.	**2 Tautuku geckos caught spotlighting.**
		JED21 towards JED11 track: 3 person hours spotlighting.	Nothing detected.
		Incidental ground ACO checks.	Tussock skink detected ACO 7.
10-04-25	Sunny changing to overcast, warm, moderate-light wind, 16.9°C-14.2°C, 60.6%-64.6% r.h.	JED29-30: 14 TACO checks.	Nothing detected.
		JED06: 20 TACO checks.	Nothing detected.
		JED21-22: 91 TACO checks.	Nothing detected.
11-04-25	Sunny, cool-warm, light breeze, 13.4°C-14.6°C, 67.4%-67% r.h.	JED33-34: 64 TACO checks.	Nothing detected.
Total		**February – 368 TACO checks** **April – 184 TACO checks and 7 hours spotlighting**	**First check – 2 x Tautuku gecko** **Second check – 2 x Tautuku gecko** **Third check – 3 x Tautuku gecko, 2 x tussock skink** **No recaptures.**

Appendix 4

Incidental discovery protocol

Overview

Incidental discovery protocols are set out below for contractors and are to be followed if any lizards are discovered during earthworks activities and vegetation clearance within the Wind Farm Site.

Lizards could be present in vegetation such as shrubs and in grassland, or within rock outcrops or in tree cavities and foliage. They may also bask in sunny exposed spots, or thermoregulate under rocks. They may be uncovered when disturbed by habitat clearance or earthworks. The incidental discovery protocol shall be followed at all times.

Project preparation

All contractors must carry a hard-sided container with air holes (such as an ice cream container), **every day** in case of lizard discovery. Refer to the potential species that may be encountered (below) for more detail on what to look out for. All new contractors/site employees should be familiar with this incidental discovery protocol.

Species that may be encountered

Indigenous lizard species that are likely to be encountered during earthworks and their habitat use are indicated in Table 1. Note that green skink is listed as Threatened - Nationally Critical.

IF ANY OF THESE SPECIES ARE FOUND/CAPTURED, NOTIFY PROJECT HERPETOLIST AND FOLLOW INCIDENTAL DISCOVERY PROTOCOLS OUTLINED BELOW

Table 14 – Indigenous lizard species that could be encountered during earthworks (with their national threat status) and their habitat use.

Species	General habitat use
Tussock skink (*Oligosoma chionochloescens*) At Risk - Declining	A range of habitats including coastal dunes, wetlands, grassland, shrublands, rocky shrubland/herbfield, screes, tussock, stony river beds and even cities (from sea level, up to 1,800m). More frequently seen as they are avid sun-baskers.
Tautuku gecko (*Mokopirirakau* "southern forest")	Inhabits a range of forest types, including scrub and shrubland possibly rocky outcrops.
Herbfield skink (*Oligosoma murihiku*) At Risk - Declining	Coastal and lowland scrubland, wetland, duneland (where it occasionally occupies exotic ice plants) and rocky grassland. Cryptic (shy/hidden) sun-baskers and therefore typically less observed.
Green skink (*Oligosoma chloronoton*) Threatened - Nationally Critical	Densley vegetated environments - wetlands, herbfield and scrubland Avid, but cryptic sunbaskers.

Tussock skink

The tussock skink (*Oligosoma chionochloescens;* At Risk - Declining) is a sleek and highly variable species. They are much more likely to be casually observed then other species as they are avid sun-baskers and are often seen/heard scurrying off when disturbed.

Tussock skink are characterised by their cream-brown to tan-brown upper surfaces, distinctive dark back stripe extending down the tail, and conspicuous cream side stripes that can be smooth or notched (Plate 1).

Lives in open and grassland environments, could be present in:

- Wetlands
- Grassland
- Shrublands
- Rocky shrubland/herbfield
- Tussock

Plate 1 – Tussock skink – most commonly found around the Wind Farm Site.

Tautuku gecko

Tautuku gecko (*Mokopirirakau* "southern forest"*;* At Risk - Declining) are a species of gecko with distinct markings, unlikely to be confused with any other species on the Wind Farm Site. They are characterised by their robust bodies, beautiful and variable markings, which can look like lichen, making them very well camouflaged on the trees they inhabit. Each gecko is unique and can be identified by its colouration and markings. A V or W can often be seen on their heads and they sometimes have bright blue eyes.

Tautuku gecko sometimes bask on trees and in foliage following bad weather. They typically do so in a cryptic (hidden) manner, so they are less likely to be observed sun-basking than other species. However, they are less obvious to detect during the day.

Plate 2 – Tautuku geckos found at the Wind Farm Site.

Herbfield skink

Herbfield skinks (*Oligosoma murihiku;* At Risk - Declining) are similar in appearance to the tussock skink. They are characterised by their chestnut to dark brown upper surfaces, which are covered by varying degrees of dark flecking, although some individuals lack flecking on the top of the head (Plate 3). A mid-dorsal stripe (broken or complete) is often present, but breaks up or is completely absent on the tail.

While Herbfield skinks do sun-bask, they typically do so in a cryptic (hidden) manner, so they are less likely to be observed sun-basking then the tussock skink. Also, in comparison to the tussock skink, they tend to occur in more vegetated habitats such as tussock grasslands, scrub, herbfields, wetlands, and boulderfields.[1]

Plate 3 – Herbfield skink found at Tiwai Conservation Area, Southland.

Green skink

Green skinks (*Oligosoma chloronoton*; Threatened - Nationally Critical) are a relatively large, robust skink compared to the tussock and herbfield skinks (Plate 4). Green skink colouration often ranges from light or dark brown through to olive, and to deep emerald green, and is decorated throughout with regular dark-edged white or pale green spots, and more irregular black flecking[2].

Plate 4 – Green skink. Captured at Tiwai Conservation Area, Southland.

[1] Jewell, T. (2022). Oligosoma murihiku n. sp. (Reptilia: Scincidae) from the south-eastern South Island of New Zealand. Jewell Publications, Occasional Publication #2022C.

[2] Jewell, T. (2008). A photographic guide to reptiles and amphibians of New Zealand. Auckland: New Holland.

Protocols for the incidental discovery of a lizard

Discover of a live, uninjured lizard

- Immediately (as soon as discovery of a lizard is made) cease construction activities to beyond 25 metres of the place of discovery. Works can recommence following approval from the Project Herpetologist.
- If possible, capture the lizard and place in a container with grass. Ensure to create breathing holes in the container for the lizard. Hold in captivity in a **cool, shady** location out of sun until a decision is made.
- If the lizard is unable to be captured and/or photographed, note as much detail as possible: what colour was it; what colour patterns; how big was it; whether it was robust or slender; what habitat was it found in? You may need to describe these details to the Project Herpetologist and DOC.
- Immediately inform the environmental manager/operations manager on-site whom will then follow the protocol outlined in this management plan, including notify the Project Herpetologist immediately (within two hours).
- Document:
  - Date and time.
  - Weather conditions.
  - Observer name(s).
  - Photographs of the animal and the location where it was found. Photograph the lizard from above trying to show the head and any markings on the upper body or back. A cell-phone picture is adequate for this and will help with identification of species.
  - Location (GPS coordinates).
  - Species.
  - Sex and age (where possible).
- Species-specific instructions, once identified by the Project Herpetologist:
  - **Tussock** or **herbfield skinks** are to be released into nearby habitat outside of the zone of impact (150 metres), or into the pre-determined release site (Matariki or Jedburgh).
  - **Tautuku gecko** must be held in a plastic hard sided container with damp vegetation and ventilation. Contractors must wait for further instruction for release of this species.
  - If any other skink (e.g., green skink) is captured, contractors will await further instruction. No releases of this species will occur without herpetologist input. The Project Herpetologist will immediately consult with DOC. Any **green skinks** discovered will only be relocated to the fenced area within the Copper Tussock Enhancement and Skink Protection Area if habitats cannot be avoided. Further works may not proceed until approval has been granted to continue or an alternative solution has been drafted for the relevant species.

Discovery of an injured lizard

- Follow the above procedures.
- Immediately (within one hour) contact a pre-identified local veterinarian, and arrange for the injured lizard to be delivered to the veterinarian. This may require a monetary contribution for care.
- Document:
  - What part of the animal is injured? (Photograph the injury).
  - Time since injury (if known).
  - Probable cause of injury (if known).

Discovery of a lizard carcass

- Notify the Project Herpetologist within eight hours. The Project Herpetologist will notify DOC and ask for advice on how to proceed.

- Arrange for the carcass to be sent to Wildbase (06 350 5329), Massey University, in Palmerston North, unless advised otherwise by DOC.
- Document:
  - Condition of carcass (see below).
  - Approximate time since death (if known).
  - Probable cause of death (if known).

Appendix 5

Soft release pen construction requirements

5. Construction of pens

The following information details the methodology for constructing temporary pens to limit post-translocation dispersal of green geckos. The following is a proven method for green geckos; however, other similar materials may also be suitable. More-expensive fencing designs are available in other countries, but it is unlikely that these are required here. If poaching is a concern, careful location of the release site and concealment through camouflage will be important considerations.

1. To construct the pen you will need a spade, plenty of warratahs (steel fence posts, also called T-, Y- and star posts), a roll of fencing wire, several rolls of heavy-duty waterproof tape (such as AG tape from CRT) and a roll of 1-m-wide black polythene (such as this: black polythene rolls)
2. Pen fences should be made of single- or double-layered heavy-duty polythene and, when completed, be at least 50 cm high, with a buried 'skirt' inside the pen that extends 15–20 cm towards the pen's centre. The skirt should be buried to at least 20 cm below ground level.
3. Clear an approximately 2-m-wide swath of ground around the selected pen area to ground level (so that there is approximately 1 m of cleared ground either side of the fence; however, if over-hanging trees are present, a greater distance may be required to prevent geckos

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from jumping out of the pen). Trim back vegetation inside the pen area so that geckos will not be able to use it to launch themselves from.

4. Dig a trench around the interior perimeter of the proposed fence line approximately 40 cm wide and 20 cm deep. Keep the excavated soil inside the pen area so it can be used to backfill over the skirt once the fence is installed. Alternatively, if a trench cannot be dug around the fence perimeter, crusher dust (fine gravel capable of firming to a hard, concrete-like state with rain) can be used to cover the skirt and help secure the posts.
5. Hammer in warratahs at 2–3 m intervals around the entire fence perimeter just on the 'outside' of the trench.
6. String a length of fencing wire right around the pen perimeter through the holes in the warratahs at a height of about 45–50 cm above ground level and pull this wire as tight as possible. It may be better to use several lengths of wire around the top of the fence to ensure it is kept tight at a consistent 45–50 cm height.
7. Lay the roll of polythene in the trench and roll it out around the perimeter of the pen. Put the soil back into the trench on top of 30–40 cm of the polythene to hold it in place (this is the 'skirt' part of the polythene that extends horizontally below ground level to stop geckos burrowing out of the pen; Fig. 1).
8. Pull the remaining approx. 50 cm of the polythene sheet up and just over the top of the perimeter wire and tape it down firmly on the other side (do this around the entire pen). This should form a rigid vertical wall that the geckos cannot climb (see Fig. 2). Taping the polythene down over the wire securely will help ensure that the pen stays intact through strong winds and other extreme weather such as snowfall. If extreme weather is of particular concern, ensure that two layers of polythene are used and add an additional wire around the outside perimeter of the pen at about 25 cm above ground level to help keep the fence rigid in strong winds. Ideally, pens should be constructed with a single length of polythene, so that only one join is needed. Any joins should be taped neatly with polythene tape, trying to avoid creases that geckos could use to gain purchase on to climb out of the pen.

Figure 1. Jewelled gecko (*Naultinus gemmeus*) on back-filled soil over plastic skirt inside a pen. Note the polythene fence constructed without folds or other irregularities which could assist lizards to climb over it. *Photo: Carey Knox.*

Figure 2. Examples of pens used for jewelled geckos (*Naultinus gemmeus*) or green skinks (*Oligosoma chloronotum*). *Photos: Carey Knox.*

9. Fill in the trench completely, pack down the soil and fill any holes in the ground that geckos could burrow into.
10. Carefully examine the entire fence looking for any weaknesses and fix them as best you can. Make sure geckos cannot get purchase on the warratahs or pieces of tape (you can lean the warratahs in towards the middle of the pen slightly so that the polythene drapes slightly away from them, or tape small pieces of foam to the warratahs to prevent them from forming a hard edge against the polythene).

11. Check on the structure of the fence regularly after translocation to ensure no defects appear and that it is holding up to the weather. Fix any defects with AG tape. Two-weekly or one-monthly checks should be sufficient and this could be tied in with the post-release monitoring schedule.
12. If poaching is a concern, camouflage will be required. Examples include using green polythene instead of black; using weedy scrub/slash (e.g. gorse) piled in front of the pen (but not close enough for geckos to use it as a means of escape) in any areas close to public access/tracks.

6. Length of time geckos need to be penned prior to release and seasonal timing of release

At the time of writing this document it was uncertain how long (both optimal and minimum times) geckos would need to be penned at release sites. However, Knox et al. (2017) found that mean dispersal distances of geckos were similar for individuals released after 4 months or 9 months. Until research demonstrates otherwise, geckos should be penned at their release sites for a minimum of 4 months, after which time the fence should be removed.

Although geckos generally move less during winter due to cooler temperatures, Knox et al. (2017) found that mean dispersal distances were not influenced by season. Their research shows that hard-released geckos dispersed significantly more than soft-released (penned) geckos during winter. Therefore, cooler temperatures should not be used as a reason to avoid using the penning technique during green gecko translocations.

Call Free 0508 WILDNZ
Ph +64 7 343 9017
Fax +64 7 349018
ecology@wildlands.co.nz

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

Regional Offices located in Auckland; Christchurch;
Dunedin; Hamilton; Invercargill; Queenstown; Tauranga;
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