

Waikanae North Development

Fast Track Application

Lizard Management Plan

Report prepared for

Waikanae North Developments Limited

Prepared by

RMA Ecology Ltd

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1.0 Introduction

Waikanae North Developments Ltd (WNDL) intends to progress a Fast-track Approvals Act (FTAA) application for a residential and commercial development in an area described as Kukutauaki, at Peka Peka Road, Peka Peka, Kapiti (the site; **Figure 1**). The site is located between the Kapiti Expressway and the Kapiti Coast, and covers approximately 141 ha not including a 3.4 ha easement area for stormwater management on the neighbouring 55 End Farm Road. The area supports mainly pastoral grazing within a lowland dune landscape.

The proposed earthworks (approximately 102 ha) for the development will result in the clearance of suitable lizard habitat (approximately 25 ha) (

Table 1). Lizard field surveys recorded one species (*Oligosoma polychroma*) at the site.



Figure 1. The site / investigations area shown within the white polygon.

1.1 Purpose and Scope

WNDL has engaged RMA Ecology to prepare this Lizard Management Plan to minimise the adverse effects of the proposal on lizards at the site. This report contains the following:

- A description of the approach for salvaging and relocating native lizards, including:
- Identifying the locations from which native lizards will be salvaged and where they will be released;
- The methods used to capture lizards; and
- The habitat enhancement and pest animal control that will be undertaken at the release site.

The outcome of this plan will be the minimisation of potential death and injury of native lizards.

This plan follows preferred methodologies and standards advocated by Greater Wellington Regional Council and the Department of Conservation.

The consent holder will hold responsibility for ensuring the successful implementation of this plan.

This plan will be implemented by a suitably qualified and experienced ecologist; the ecologist will be engaged and provided with this plan prior to implementation.

1.2 Credentials and Code of Conduct

Dr Ussher, Dr Nicole, and Mr Lurling (variously, the authors, co-authors or technical reviewers to the ecology reports and plans) are qualified and experienced ecologists.

Dr Ussher holds the qualifications of BSc, MSc (1st class honours) and PhD in conservation ecology. He has 34 years experience as an ecologist in New Zealand, with speciality expertise in herpetology, and effects assessment and management, including offset accounting and modelling.

Dr Nicole holds the qualifications of BSc, MSc, and PhD in ecology and botany. He has 9 years experience as an ecologist in New Zealand, with speciality expertise in conservation, restoration, and taxonomy with strengths in botany, biostatistical analysis, and GIS bio-analysis.

Mr Lurling holds the qualifications of BSc, Postgraduate Diploma in Wildlife Management (Distinction), and GradDip (Geography), specialising in Aquatic Ecology & Water Quality (Distinction). He has 28 years experience as an ecologist and specialises in the fields of bat ecology, wetland ecology (botany, plant communities, wetland classification and functions), avifauna, and botany.

Dr Ussher, Dr Nicole, and Mr Lurling have extensive experience in ecological site assessments, significance assessments, impact assessment, and impact management, including extensive experience on the ground designing, constructing, implementing, monitoring and reporting on interventions to restore, enhance, salvage, and protect ecology values at sites across New Zealand. They are considered to be sufficiently qualified to undertake an assessment of this kind.

Although this document has not been written as a statement of expert evidence, we confirm that at all times we have complied with the Environment Court's Code of Conduct for Expert Witnesses contained in its Practice Note 2023 as well as the UDIA Code of Ethics. No part of this report has been authored by an AI or other software.

We declare that in relation to our role in providing expert ecological assessment and advice for this project we are not, to the best of our knowledge, subject to any real or perceived conflicts of interest.

1.3 Consent conditions

This LMP will be updated with the relevant resource consent conditions and/or Wildlife Act conditions upon granting of consents.

[This section of the LMP will list the relevant conditions of consent relating to lizard management].

2.0 Lizards

2.1 Overview

The history of vegetation clearance, pasture establishment and stock grazing, and the presence of a range of exotic predator animals is likely to have exerted sustained pressure on lizard populations and their ability to remain on or repopulate the site.

Repopulation ability of lizards is important for understanding lizard density estimates. For example, there may be high quality habitat absent of lizards, because it had been previously cleared for agriculture; or there may be low quality habitat with lizards, because it was used as refuge from loss of adjacent habitat.

The historic phases of vegetation change, the types of vegetation, maintenance or removal of corridors, and the fragmentation of vegetative habitat, all can contribute to local distribution. Various vegetative habitats across site may only support certain lizard species if the convoluted pattern of historic vegetation removal, forestry, pest weed and animal encroachment, and pasture conversion maintained suitable habitat through time and space.

In addition to management activities, another factor for local lizard distribution is the history and intensity of predator pressure. The site is likely to have a range of pest animals which could predate on lizards. For example, while surveying, cats were seen roaming the site.

2.2 Site survey

A lizard survey was undertaken by RMA Ecology Ltd to assess the presence and distribution of lizard species at the site. The methods used were selected based on the species which could be present. The survey included desktop survey, habitat assessment, debris inspections, artificial cover object (ACO) layouts, and pitfall trapping.

The approach for this lizard survey was guided by walkover surveys, the history of the site, and the lizard habitat assessments. Survey effort and location was developed accordingly.

Lizards were surveyed using a combination of two systematic methods and active manual searching beneath natural cover objects. More detail is described for each below.

1. **Artificial cover objects (ACOs)** are an effective survey method for skinks (and sometimes geckos) when there is a local abundance of habitat. Three 400 × 500 mm sheets of corrugated Onduline™ (a bitumen saturated material) are laid on top of each other in a “triple-stack”. Small wooden rectangles were pre-installed on the bottom of each sheet to create a 10 mm gap between sheets for protective habitat.

ACO triple-stacks were installed in areas of potential habitat where lizard encounters were considered likely. In these areas, rank grass and weeds were mown with a line-trimmer so the triple-stack could be laid flush with the ground in selected best-suitable locations. ACO triple-stacks were installed in clusters of 4 at 23 locations (



Figure 2).

After installation, the ACOs were left for a minimum of five (5) weeks to allow familiarity and occupation by lizards. ACOs were then checked by carefully and quickly moving the triple-stack over a large bin, searching the ground underneath, and searching through each sheet. ACO clusters were removed if lizards were found, because presence in that habitat was confirmed. Otherwise, clusters were checked daily for four (4) to five (5) days. If lizards were not found after this period, the clusters were removed and the area was classified as having a low likelihood of lizard presence.

2. **Pitfall traps** are an effective survey method which lures lizards with sugary bait into a safe inescapable container. Pitfall traps were installed on day two (2) of the five (5) day survey. There were five (5) localities which had moderate–good habitat, but lizards were not found in the ACOs. Pitfall traps were installed at each of these five (5) ACO cluster locations.

Installation included digging holes, placing 4 L buckets with pre-drilled drainage holes on the bottom, baiting the buckets with wet sponges with fruit paste drizzled on top, and covering the bucket with a 400 × 500 m Onduline sheet.

Pitfall traps were installed on the second day and checked and reset for the remaining three (3) days alongside ACO checks. Pitfall traps were to be removed if mice were found inside, however, no mice were found in any pitfall trap meaning that all pitfalls could be operated as intended.

3. **Manual searches** were undertaken during autumn, winter, and spring surveys. Natural cover objects (e.g., logs) were lifted to check for lizards. Similarly, suitable locations were visually searched to check for basking lizards.

Searches and handling of native lizards at this site were undertaken under the Wildlife Act Authority 117825-FAU issued to RMA Ecology Ltd for the Wellington Region. Data were recorded for each captured lizard before release, including date, ACO cluster, species, age class, sex, original tail length, re-grown tail length, and weight.

2.3 Survey Results

A desktop assessment found that seven native species of lizard could be possibly present at the site based on range overlap and habitat preference (**Appendix 2: Table 5**).

During the field surveys there were 31 northern grass skinks (*Oligosoma polychroma*) recorded in total. No other species of lizards were caught, seen or observed. At the *Muehlenbeckia complexa* dune scrub, two gravid females were detected (Clusters 19 and 22). There were also three lizards recaptured on the second day of searches in the same locations (Clusters 19 and 22). Across the site, several lizards were seen basking on top of the ACO triple-stacks and escaped as the ecologists approached.

Clusters 18–20, placed in the *Muehlenbeckia complexa* dune scrub, had the highest level of lizard activity ranging from average counts of 1 to 4 lizards per check (

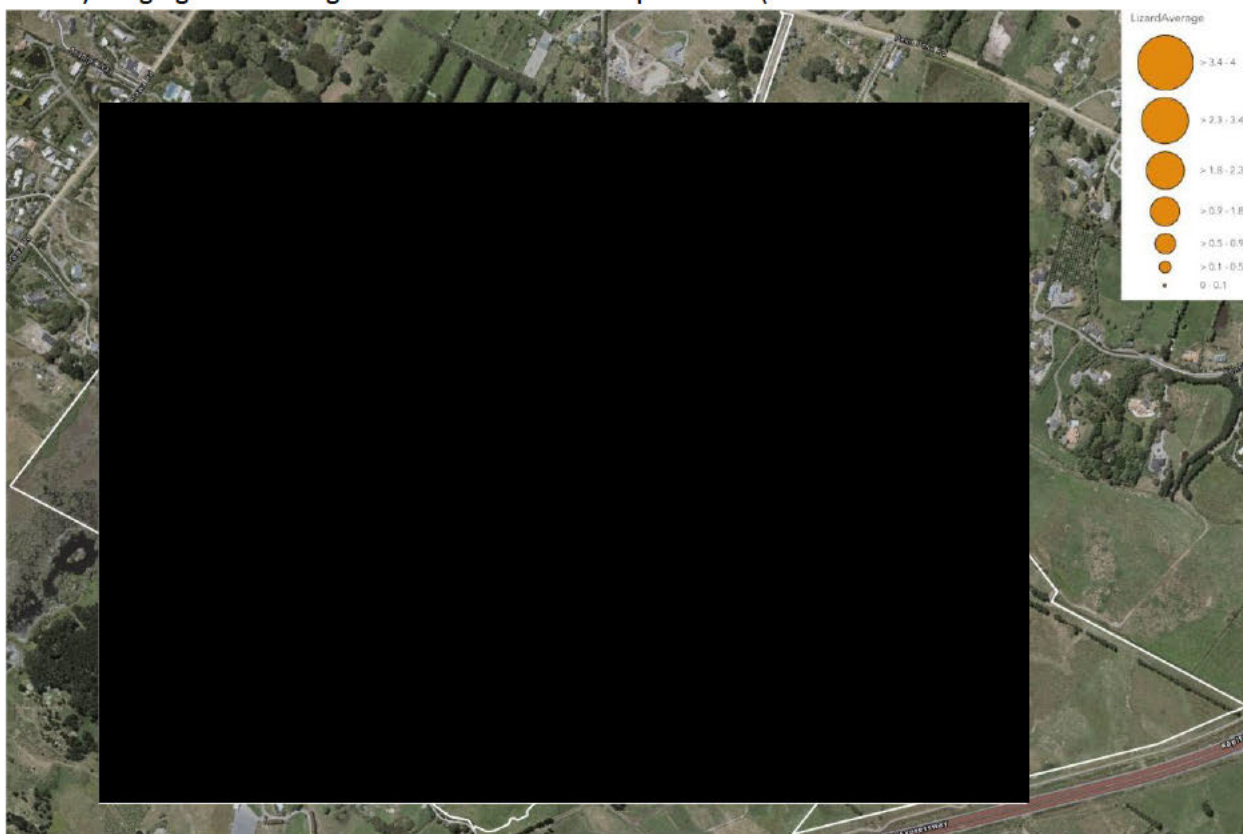


Figure 2). Clusters 11–13 were the next most abundant group in the western part of the site, ranging from 0.33 to 0.75 lizards per check. Lizards were found at two other clusters at site: cluster 9 in the southeast and cluster 4 in the northeast.

No lizards were caught in the pitfall traps. Several individuals were seen basking on rocks or underneath logs. All of these were northern grass skinks.

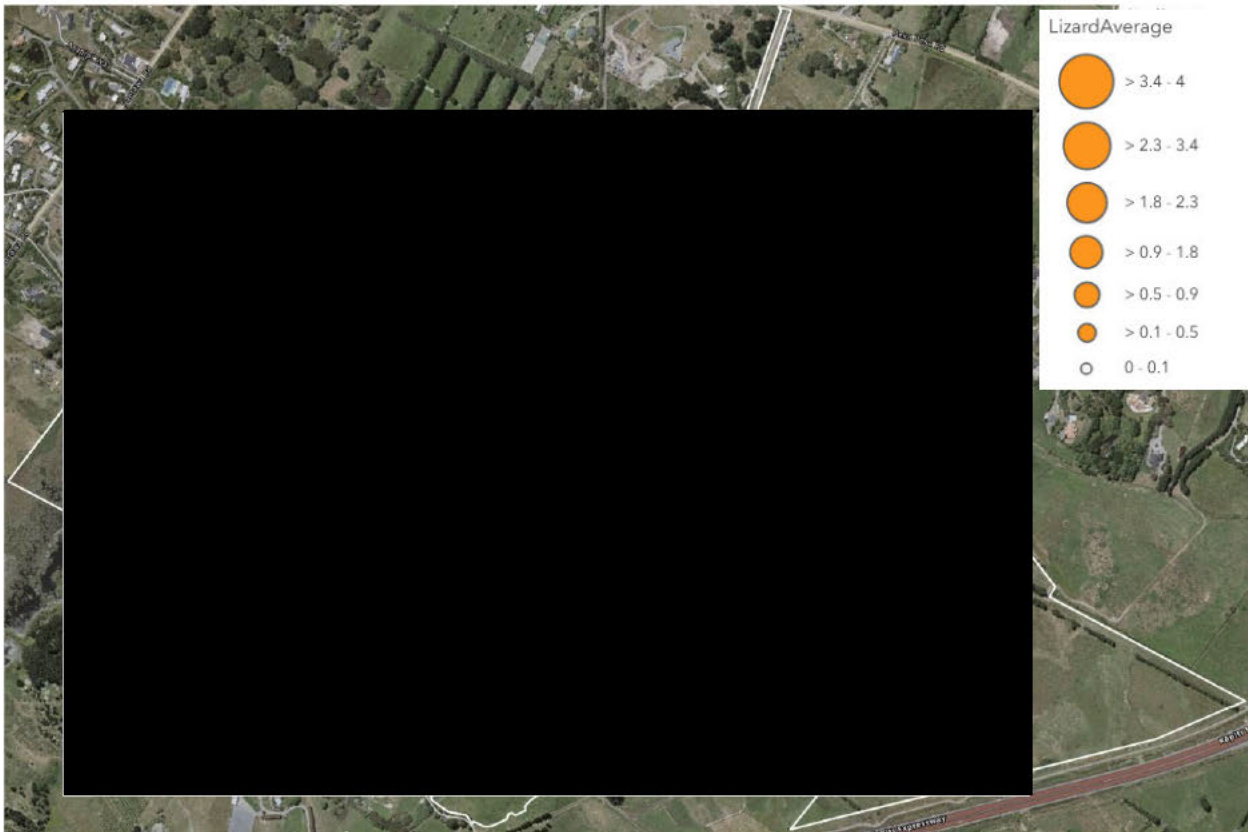


Figure 2. Average count of northern grass skink per ACO cluster per check. Clusters with white circles had no detections.

2.4 Lizard habitat

Suitable lizard habitat was mapped across the site and then classified as low, moderate, or high quality (**Figure 3, Table 1**). The grading was based on present structural availability, lizard surveys, and historical management. Most of the site has been heavily modified for agriculture or forestry, or both. Recent forestry clearance has left some areas with slash. Other areas have been neglected for several years, and mixed exotic shrubland, rank grassland, and scattered exotic trees have taken hold.

Common exotic species include blackberry (*Rubus fruticosus* agg.), broom (*Cytisus scoparius*), pampas (*Cortaderia selloana*), lupin (*Lupinus arboreus*), and inkweed (*Phytolacca octandra*). Relevant native vegetation includes one established population of pōhuehue (*Muehlenbeckia complexa*), several scattered pōhuehue individuals amongst mixed exotic shrubland, and several scattered divaricate shrubs (*Coprosma propinqua*) spread around site.

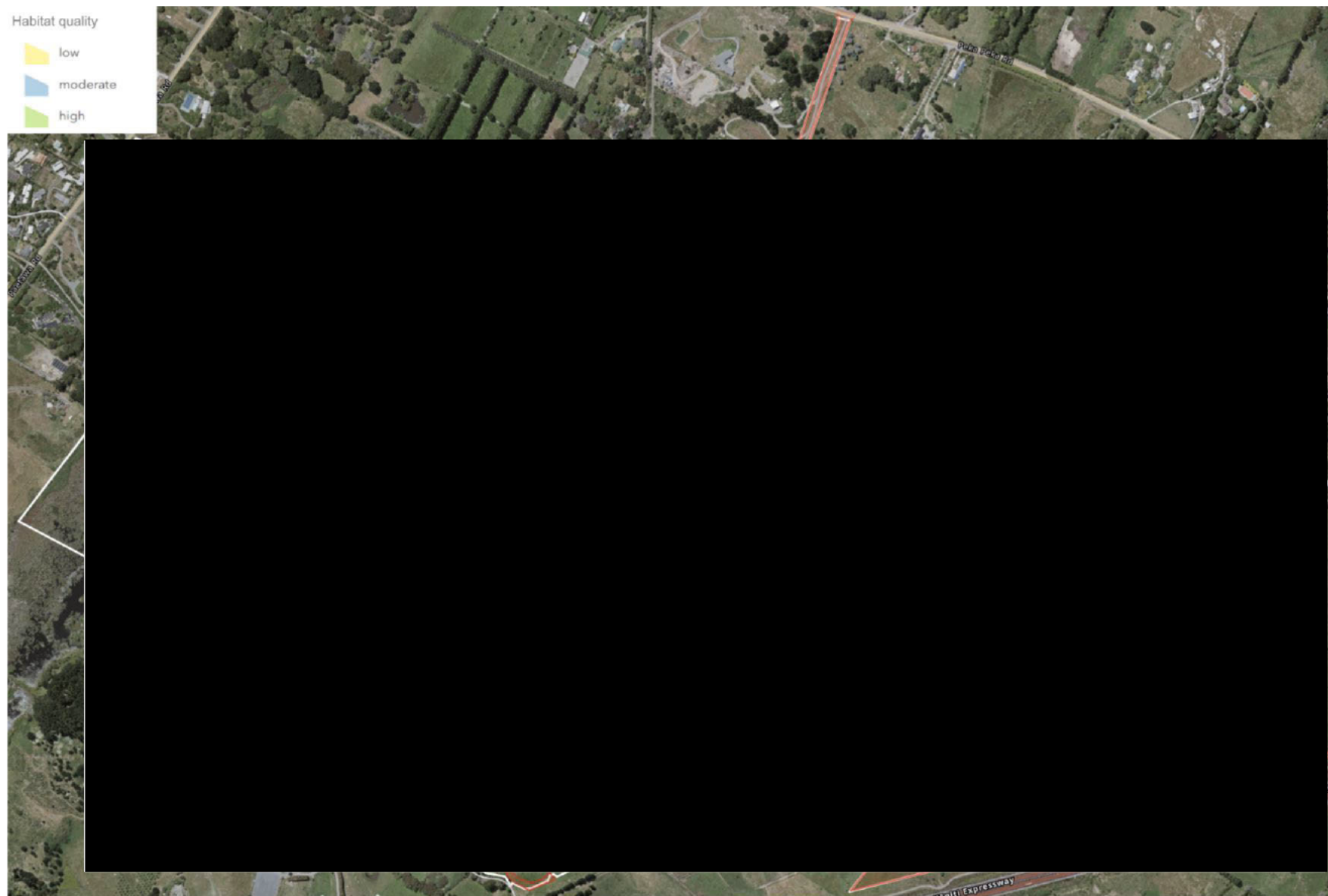


Figure 3. Suitable lizard habitat across site, classified as low (yellow), moderate (blue) and high (green) quality. Earthworks extent at site (red shade and outline).

Table 1. Lizard habitat summary statistics, in particular, lizard habitat areas and proportions which overlap with the 102 ha of earthworks (impact).

Lizard habitat	Total area (ha)	Proportion of habitat (%)	Impact area (ha)	Proportion of impact (%)	Proportion of original habitat (%)	Area remaining (ha)	Proportion of original habitat remaining (%)
High	1.95	5.2	0.57	2.3	29.2	1.38	70.8
Moderate	10.20	27.6	5.24	21.0	51.4	4.95	48.6
Low	25.41	67.7	19.17	76.7	75.4	6.25	24.6
Total	37.56	100	24.98	100		12.58*	

*12.58 ha of lizard habitat is outside the proposed earthworks extent; 5.8 ha will be used as cohesive release habitat (



Figure 4).

Low quality habitat – generally contains grazed pasture grasses and rank grassland (**Appendix 3: Plate 3, Plate 4**). Lizard surveys detected one lizard in the middle of a paddock at a pile of cut exotic trees. If northern grass skink is also present elsewhere, it is likely that populations will be patchy and at low density because of the low quality habitat. The current earthworks proposal includes 19 ha of low quality habitat, and this habitat accounts for more than 75 % of impacted lizard habitat (

Table 1).

Moderate quality habitat – generally contains a mix of exotic and native vegetation left undisturbed for several years or exotic shrubland growing through forest slash (**Appendix 3: Plate 4**). There is moderate structural complexity for lizards to find safety, including amongst scattered individual pōhuehue or divaricate shrubs. There also has been several years for lizards to repopulate the sites. Lizard surveys detected several northern grass skinks in these moderate habitats. Approximately half of the moderate habitat is within the earthworks footprint (

Table 1), much of the remaining moderate quality area is on the central dune leeward slopes (**Appendix 3: Plate 6**).

High quality habitat – is restricted to the established population of pōhuehue (**Appendix 3: Plate 5**). It has remained undisturbed for several years and there is sufficient structural complexity for lizards to hide and shelter inside the shrub. This high quality habitat occupies a small area in the centre of the central dunes (**Figure 3**). It accounts for 2 % of the impacted lizard habitat (0.57 ha), and 70 % of the habitat will remain unimpacted (**Table 1**).

Overall, lizards were in detectable quantities in the moderate and high quality habitat. However, we have been precautionary in designating these areas:

- surveys detected one individual in low quality habitat; accordingly, salvage efforts will still be undertaken;
- moderate habitat has been extended to cover comparable habitat, even if surveys failed to detect lizards there.

Lizard salvage will be therefore be undertaken across all suitable lizard habitat, utilising various approaches tailored to the habitat quality.

2.5 Salvage approach

The approach to this salvage is informed by the results of the surveys and assessment of local records, habitat preferences, and the history of the site in terms of land use, vegetation clearance, and the presence of pest animals.

The aim is to salvage as many of the native lizards from the site as practicably possible given the range of methods at our disposal.

All species that are considered possibly present in a particular habitat type that is scheduled for clearance will be targeted using best practice methods.

The salvage and relocation will be undertaken by a suitably qualified and experienced ecologist or herpetologist.

2.5.1 Timing

All lizard salvage will be undertaken during the active season for lizards (between October and April). Lizard salvage will only be carried out during rainless, fine, mild weather conditions, generally when daytime temperatures are between 12–20 °C. Salvage using manual searches, ACOs and pitfall traps will take place prior to earthworks, and machine-assisted salvage will occur prior to, or during vegetation clearance preceding bulk earthworks. Further key timeframes are described in section 2.5.2 and 2.5.4.

2.5.2 Methods

The suite of techniques that will be applied to each area was adjusted based on the habitat classification. The following methods will be employed:

- For **low** quality areas:
 - Manual search of scattered natural covered objects; and
 - Machine salvage - Supervised removal of large slash and log piles at the discretion of herpetologist. There are few of these areas within this habitat class.
- For **moderate** quality areas:
 - Manual search of scattered covered objects;
 - Machine salvage - Supervised removal of large slash and log piles; smaller slash and log piles at the discretion of herpetologist; and
 - ACOs, or pitfall traps, or both will be installed around the edges of shrubland, large slash, and log piles.
- For **high** quality habitat:
 - Manual search and removal of scattered covered objects;
 - ACOs and pitfall traps at a high density (e.g. one per 5 m × 5 m grid) in and around pōhuehue shrub;
 - Lizard proof fences installed along the edge of the earthworks perimeter that dissects pōhuehue shrub to prevent reoccupation of salvaged areas following salvage;
 - Machine salvage – supervised removal of pōhuehue shrub and adjacent covered objects with an excavator. All viable habitat will be carefully inspected by the supervising ecologist in conjunction with the excavator operator, after all other salvage methods have been applied.

These methods will be implemented as follows:

1. **Manual search and salvage** – Walking slowly and systematically through potential habitat while visually scanning the surroundings for basking or foraging lizards, including investigating vegetation and the ground, and lifting potential refuges such as logs, farm debris, and loose vegetation to search beneath. When a lizard is found, the lizard will be carefully captured by hand. Searching and salvaging will be undertaken on rainless days and when temperatures are expected to be between 12–20 °C.
2. **Supervised removal of habitat** – Careful removal of habitat will allow the herpetologist to detect and capture lizards which may otherwise be hidden or inaccessible. Several options are available at the discretion of the herpetologist, including:
 - a) **Manual deconstruction** of small or isolated wood stacks, or fragmented rock.
 - b) **Tree felling** with an arborist will allow the trunks, cavities, and canopy to be inspected by a herpetologist. Appropriate-sized features and trunks will be removed and inspected in an orchestrated, safe, and timely manner. Felled native trees will either be moved

into nearby native bush and left permanently, or left for two weeks to enable lizards to relocate before the felled trees are removed from the site.

- c) **Machine assisted removal** with an excavator under the supervision of the herpetologist. Rank grass, tussocks, and log piles can be inspected by a herpetologist after removal by an excavator with a claw bucket or mulcher. Mechanical removal of habitat will be carefully orchestrated between the machine operator and the herpetologist to capture lizards unharmed. For example, rank grass will be raked with a claw bucket, exposing the top soil, providing opportunities to capture lizards. Lizards will remain unharmed because they can escape the bucket teeth. Mulchers can also be adjusted to heights where lizards can safely escape below. Where necessary and practicable, habitat (such as tree slash or tree stumps) will be removed from the earthworks footprint and placed within low quality areas at the release site. This will prevent reoccupation of sites within the earthworks footprint between salvage and development.

3. **Artificial cover objects (ACOs) and pitfall traps** – As well as surveying skinks, ACOs and pitfall traps are an effective means of salvaging skinks. ACOs and/ or pitfalls will be installed in areas of moderate and high potential habitat where lizard encounters are considered possible, including where vegetation is dense and supports good ground cover for skinks.

ACOs will be placed and left for a minimum of six weeks to allow occupation by lizards. They will then be checked a minimum of five times prior to the commencement of vegetation clearance and earthworks within that habitat.

Pitfalls are installed at least a week prior to trapping, and for precautionary measures, they are left unset and inactive, with lids securely fastened, and filled with leaves and grass.

Pitfalls are set by removing the lid, leaves, and grass, and baited with a sugary substance on a wet sponge.

All ACO and pitfall checks will be undertaken within two (2) weeks of the start of vegetation clearance at that location. This time constraint prevents reoccupation before habitat clearance. ACOs will be checked (and any lizards present captured) on fine, mild days when ACOs are most likely to be occupied. Because pitfalls are baited and inescapable, they will be checked daily.

2.5.3 Lizard handling, processing and data collection

The capture and relocation will be undertaken in the most appropriate way to minimise stress on lizards. To ensure the welfare of animals during transport, and to maximise the chance of a successful relocation, the relocation team will include members with suitable training and experience in capturing, handling, holding, and releasing techniques. Lizard handling will be kept to a minimum and will only be carried out by trained and experienced staff. Handling will be limited to capture, measurement, sex determination, and photography.

Captured lizards will be relocated and released at designated sites within 6 hours of capture (

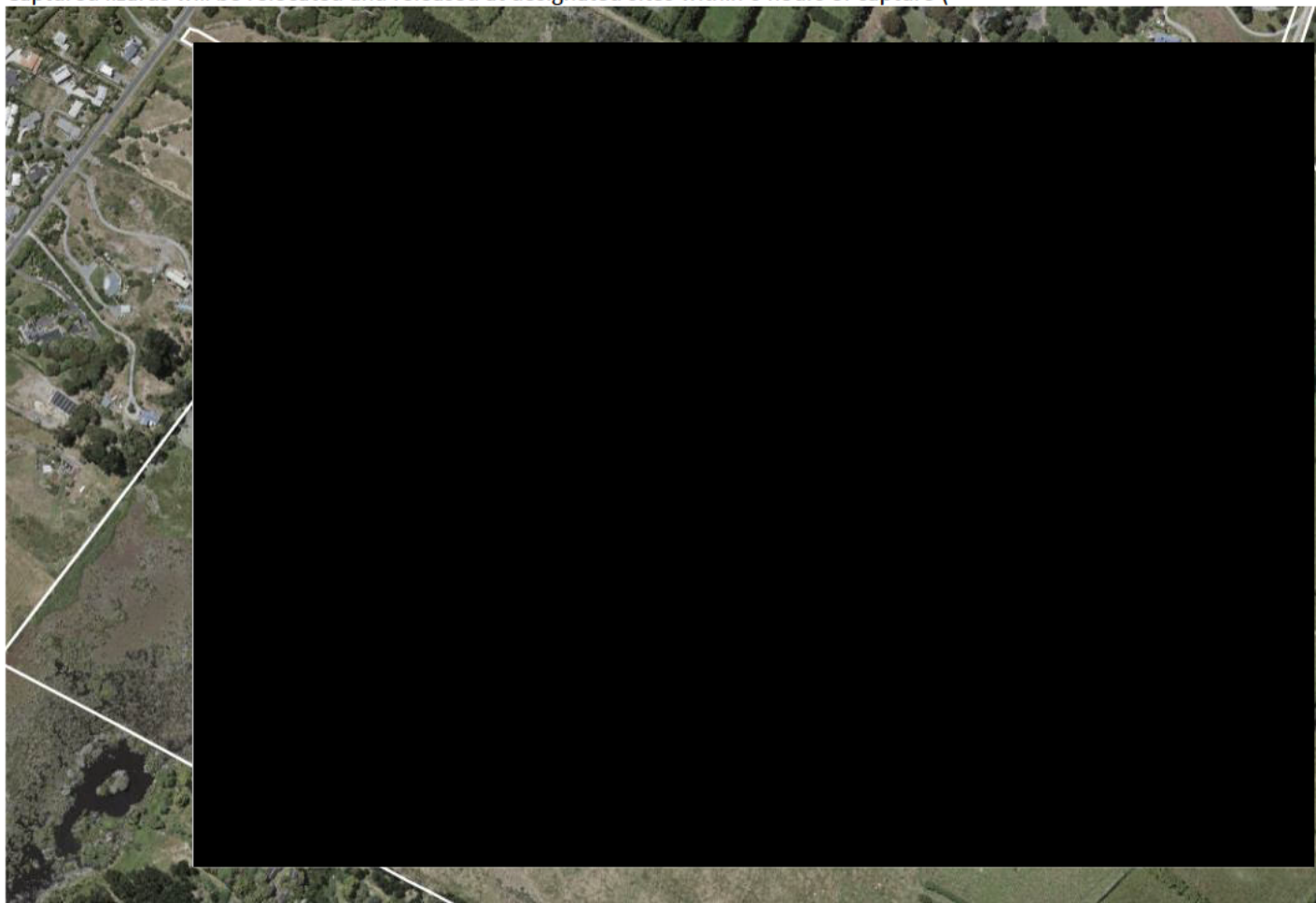


Figure 4). Lizards will be held in breathable cloth bags in a secure terrarium in the shade (ideally where the internal temperature is kept below 10 °C) until released. More than one lizard may be held in each container, but this will depend on the level of aggression within the species, size of each individual (small individuals may be eaten or injured by larger ones), sex, temperature and amount of cover. Adults will be held individually; juveniles can usually be held safely in small groups of similar-sized individuals of the same species.

When a native lizard is captured, the following data will be recorded:

- Time and date of capture;
- Species of native lizard;
- Sex;
- Age class (adult, sub-adult, juvenile);
- Weight;
- Length – snout-vent, regenerating tail, and original tail;
- Reproductive status;
- Photograph taken of animal (dorsal and ventral view to record colour and scale patterns) and habitat; and
- GPS coordinates of capture location.

In addition, the total time spent searching and number of personnel involved will be recorded to obtain an estimate of captures per unit search effort across nights, habitats, and species.

2.5.4 Site management after salvage

Vegetation clearance will be undertaken within seven days of the end of the pre-clearance salvage. In most instances, vegetation clearance will be undertaken under supervision of a herpetologist such that no lizard habitat will remain following salvage efforts.

Cut woody vegetation should be placed into nearby retained shrubland where practicable to allow any undetected or salvaged lizards in the vegetation to be transferred into safe suitable habitat.

Cleared area perimeters will be fenced where it adjoins high lizard habitat. The herpetologist will take discretion about fencing moderate habitat. The fence will be a silt fence with smooth plastic attached to the upper part of the fence that prevents lizards being able to climb over.

2.6 Release site

2.6.1 Selection and suitability

The application site contains a semi-continuous band of lizard habitat outside of the planned earthworks extent (



Figure 4, Plate 1). The 5.8 ha area was selected according to a range of factors (Table 2,

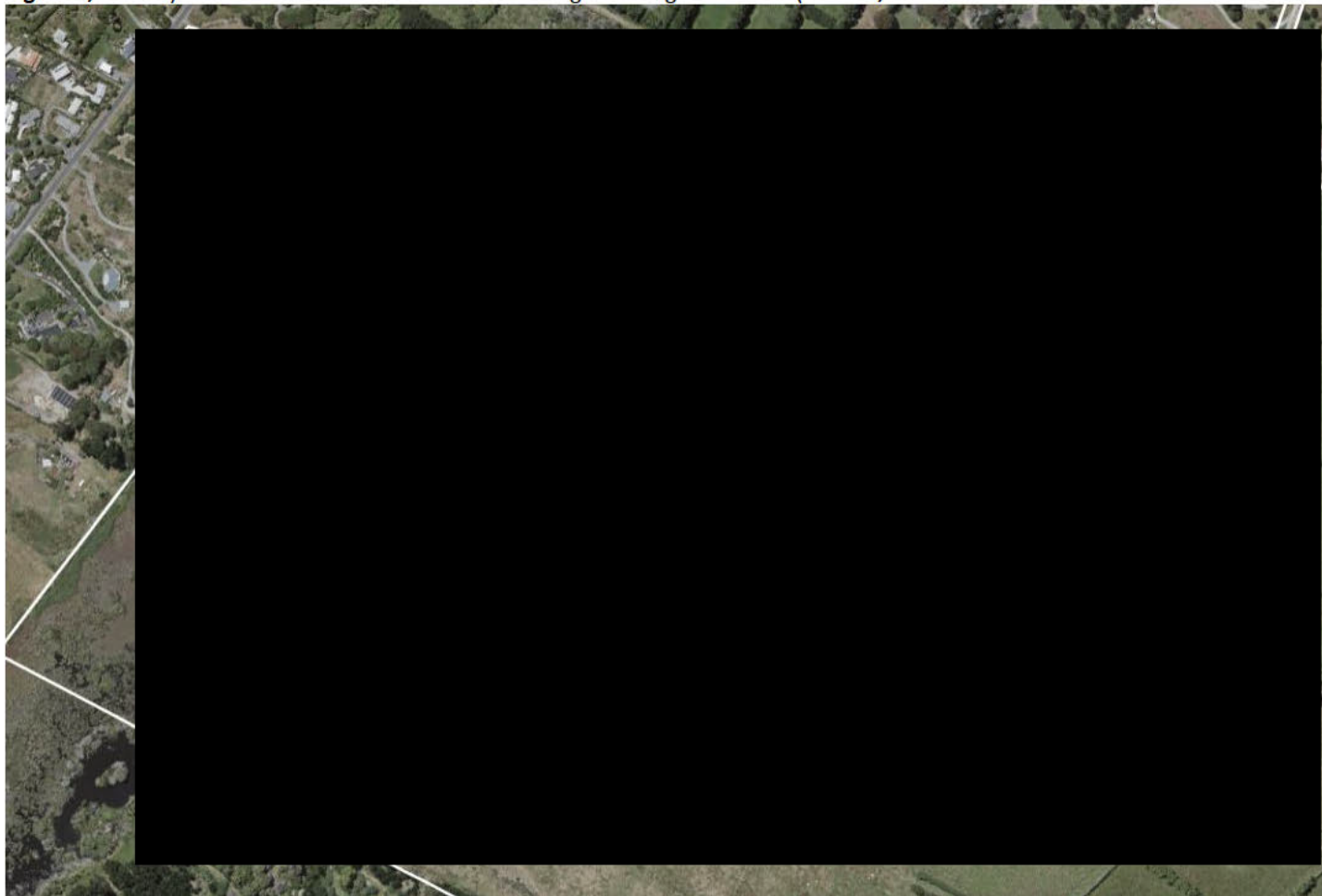


Figure 4).

Table 2. Release site suitability.

Suitability factor	Release site description
Habitat	The release site area includes 1.4 ha of high quality habitat, and 4.4 ha of moderate quality habitat.
Long-term protection	The release site is currently owned by the developer and will be encumbered by a consent notice to ensure that the release site will be physically protected in perpetuity regardless of current land ownership or any future ownership/tenure changes. There are no plans for its development.
Accessibility	The release site is within the same property and very accessible to all other salvage locations, including a few minutes driving time or maximum half an hour walking.
Size	The release site area is approximately 5.8 hectares. It currently includes a range of habitats, but it is not connected to other sites. It is large enough to accommodate the relocated lizards alongside the current lizard population, with habitat potential for population increase into adjoining restoration protected areas on duneland within the site.
Existing lizard populations	The existing population of lizards at the proposed release site is considered to be severely depleted.
Predator control	Predator control has been intermittent at the site. It is likely that a range of exotic predators are present and that lizard populations are consequently constrained.

Control of introduced mammalian predators will commence prior to the release of lizards into the release site.



Figure 4. Lizard release site area (green polygon), composed primarily of high and moderate quality lizard habitat remaining after earthworks (see **Figure 3**), as well as existing retained shrubland/rushland (green polygons) and proposed shrubland planting zone (violet polygons). Also shown are proposed treeland planting zones, and the wider dune top open space area.



Plate 1. Photographs taken across the pre-development release area (



Figure 4).

2.6.2 Habitat enhancement and pest animal control

The existing populations of lizards at the proposed release site are likely suppressed by animal pest pressure, as well as a lack of habitat refuges and complexity. Therefore, releasing additional lizards should be in conjunction with habitat provision and enhancement, livestock removal, and a pest animal control plan.

2.6.2.1 Pest animal control

A combination of bait stations, traps, and shooting will be used to target pest animals at the site and within the lizard release area (Table 3). The 5.8 ha release area for lizards salvaged during the development will be subject to an intensive pest control regime (Table 4). The target species are browsing pests (possums, hares, rabbits) and predatory pests (rats, mustelids, hedgehogs, and feral cats). Ungulates such as deer, goats, and pigs are absent.

The approach for pest animal management across the site will include:

1. Baseline monitoring to determine the presence, abundance, and distribution of the target pest animal species;
2. A management regime with methods suitable to control all target pest species to target levels, including a knock down and maintenance periods, and provision for intensified control to reduce risks to relocated native lizards;
3. Ongoing monitoring to track the progress of pest animal control efforts; and
4. Educational material relating to the management of domestic cats that will be provided to landowners.
5. Cat management is described in the Ecological Restoration Management Plan (ERMP).

Table 3. Pest animal control device numbers at the release site (5.8) based on per area intensity (Table 4).

	Philproof bait station	Pestrol bait station	Live capture cat trap	DOC200
Intensity	2 / ha	5 / ha	1 / 5 ha	1 / 2 ha
Release site	12	30	1	3

The overall pest control programme presented here is in preliminary form. Control methods, timing, and frequency will be reviewed by a qualified pest animal control expert and modified, if necessary, to provide an effective pest animal control programme for the site, including this lizard release area (Table 4).

Table 4. Pest animal control methods and targets.

Pest animal	Control method	Lizard release site intensity	Knock down frequency	Maintenance frequency	Target
Possum	Tree-mounted Philproof bait station	2 / ha	One service per month for three months	Quarterly refills/Bait replacement	Below a 10% Chew Card Index
Rabbit and hare	Thermal Assisted Night shooting	Around browsing vulnerable planted areas	Weekly visit for one month.	Monthly visits for first two years following planting	No mortality of planted plants
Rats	Pestrol bait stations	5 / ha	Once a week for the first month	Quarterly refills/Bait replacement	Below a 10% Chew Card Index
Hedgehogs	DOC200	1 / 2 ha	Once a week for the first month	Quarterly refills/Bait replacement	No target required
Mustelids (ferret, stoat, weasel)	DOC200 or DOC250	1 / 2 ha	Once a week for the first month	Quarterly refills/Bait replacement	Evidence of a declining catch rate that stabilises at a very low level
Feral cats	Live capture cage trap with sensor node (e.g., Econode) to alert contractor	1 / 5 ha	Within 24 hours of being alerted	Within 24 hours of being alerted	Evidence of a declining catch rate that stabilises at a very low level

2.6.2.2 Habitat enhancement

Habitat enhancement will be carried out at the release site to support lizards that we anticipate to salvage, with targeted measures to meet their specific habitat requirements:

- **Revegetation** will increase the suitable habitat availability with refuges and structural complexity. Extensive planting of pōhuehue and oioi will be necessary to provide adequate habitat; scattered intermixed divaricate shrubs will supplement complexity and refuges.

At least 1.07 ha of the high dunes will be restored through shrubland planting, with a focus on provision of high quality lizard habitat. Approximately 0.57 ha of indigenous dune shrubland will be established adjacent to the retained indigenous vegetation fragments, corresponding to the area of high value lizard habitat lost through development. In addition, a further 0.57 ha of indigenous dune shrubland planting will take place elsewhere in the central dune reserve area, providing connections within the site and to adjacent areas of dune ridge to the north and south.

This will result in a total of 1.14 ha of mitigation shrubland planting in the dunes area, at a loss:gain ratio of 1:2. Mitigation planting will occur in 30 nodes, with each node containing approximately 200 plants spaced at 1.4 m centres for shrubs, and 0.5 m centres for herbs. Each node will cover an area of around 350 m². Revegetation will increase the suitable habitat availability for native lizards, providing refuges and structural complexity. Planting will be dominated by pōhuehue to provide adequate habitat; with oioi, knobby club rush and scattered intermixed divaricating shrubs to supplement complexity and refuges.

Additional planting of 0.4 ha is proposed in the landscape planting plans in the landscape set provided by Eliot Sinclair, and by Local Landscape Architecture Collective. Combined mitigation and landscape dune shrubland planting areas of 1.54 ha are delineated in **Figure 4**.

The remaining open areas of the dunes open space area will be subject to weed control, and will support rank grass (except where treeland planting occurs), which are expected to transition to native vegetation over time as the planting nodes progressively expand through natural processes.

- **Stock exclusion** through fencing (either the release site, or the wider Application site if stock are proposed to be removed from the farm) will prevent trampling, disturbance, and grazing of release areas, allowing revegetation to thrive, especially plantings of pōhuehue, oioi, and divaricate shrubs.
- **Log stacks:**
 - 60 log stacks will be installed in the release site.
 - 20 log stacks installed within the existing high quality habitat.
 - 40 log stacks installed within remaining planting areas.
 - Log stacks will be installed in clusters of five (5) for habitat connectivity.
 - Each log stack will be placed within 5 m of other stacks in the same cluster to create a small network of shelters;
 - Each log stack will be constructed with 6–8 logs or thick branches (approximately 5–15 cm diameter) (**Plate 2**).

- The wood for the stacks will be sourced from tree species that are not able to propagate vegetatively (e.g., willow can regrow from broken branches and so should not be used). Stacks will be strategically placed under the supervision of the herpetologist to ensure tight crevices are established which provide immediate refuge for any lizards that are released into these areas. These log stacks will be installed at least 1 month prior to the commencement of the lizard salvage, so that log stacks are ‘bedded in’ for any lizard release.



Plate 2. Examples of log stack lizard habitat. The release site will include 60 log stacks.

2.6.3 Monitoring

No post-release lizard monitoring is proposed, as the number of lizards anticipated for release is low, and the likelihood of being able to consistently recapture released lizards is also low. Monitoring to robustly record baseline, change in state, and resident versus released animal trends will impose an exceptionally high cost on the project, with a low likelihood that the results will provide a statistically meaningful insight in relocation success.

This assertion is based on similar post-release survey work undertaken by RMA Ecology for northern grass skinks and Waitaha geckos in north Canterbury where a population of 60 lizards was released into an intensively monitored area as part of a comprehensive pre-monitoring and post-monitoring assessment. The site was intensively controlled for animal pests, and within a year, no relocated lizards were recaptured. The proportion of relocated lizards recaptured had dropped to nil — potentially due to aversion to ACOs or preference for other habitats.

2.7 Management considerations

2.7.1 Accidental discovery

If any lizards are accidentally encountered during construction, works will cease immediately within 10 m of that encounter location, and the project herpetologist will be contacted.

2.7.2 Credentials and permitting

This part of the Plan relating to lizards been reviewed and authorised by Dr Graham Ussher, who is a qualified herpetologist. The herpetologist managing the implementation of this LMP is Dr Graham Ussher. All lizard salvage work will be undertaken in accordance with a current DOC Wildlife Act Authority.

3.0 Reporting

For lizards, a report will be provided to Kapiti District Council and the Department of Conservation within three months of the end of the lizard salvage.

The report will detail:

- The effort expended during the salvage, including the locations searched or trapped, and the person-hours spent salvaging;
- The number of lizards salvaged and where they were released; and
- Data collected.

In addition, the results of the lizard salvage programme will be reported to the Department of Conservation by way of an ARDS card submitted for the national Herpetofauna database.

Report prepared by:



Reviewed by:



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Dr Duncan Nicol

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Graham Ussher

Senior Ecologist¹

Principal Ecologist

26-Mar-26

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¹This report has been prepared for the benefit of our Client with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose without our prior review and agreement. Any use or reliance by a third party is at that party's own risk. Where information has been supplied by the Client or obtained from other external sources, it has been assumed that it is accurate, without independent verification, unless otherwise indicated. No liability or responsibility is accepted by RMA Ecology Limited for any errors or omissions to the extent that they arise from inaccurate information provided by the Client or any external source.

Appendix 1: Consent Conditions

Appendix 2: Desktop lizard survey results

Table 5. Lizard species which are known in the wider area surrounding the site, with their conservation status, preferred habitat, and likelihood of presence at the site.

Species	Common name	Conservation status	Preferred habitat	Presence likelihood
<i>Naultinus punctatus</i>	Barking gecko	At Risk - Declining	Being an arboreal species, barking geckos are closely associated with forested habitats, and thus inhabit a wide variety of forest types in the south-eastern North Island, including swamps, scrubland, sub-alpine scrub, and mature forest. They appear to favour scrubby or regenerating habitats.	Very low
<i>Mokopirirakau</i> "southern North Island"	Ngahere gecko	At Risk - Declining	Being an arboreal species ngahere geckos are closely associated with a range of forested habitats, including swamps, scrubland, and mature forests (beech, podocarp, and broadleaf).	Very low
<i>Woodworthia maculata</i>	Raukawa gecko	Not Threatened	Often associated with rocky habitats throughout the country, however, they can actually be found in a vast array of habitats, from sandy or rocky coastlines right through to inland beech and broadleaf forests.	Low
<i>Oligosoma polychroma</i>	Northern grass skink	Not Threatened	Occupies a wide range of habitat types preferring open areas including coastal vegetation, rock piles, grassland, flaxland, shrubland, screes, forest margins tussock and modified urban or suburban habitats. Often takes refuge in dense vegetation or under rocks and logs when not active.	High
<i>Oligosoma aeneum</i>	Copper skink	At Risk - Declining	Inhabit areas with good ground cover in open and shaded areas of forests. In coastal areas, copper skinks can be found close to the high tide line. Copper skinks are also found in urban areas, most commonly found in thick-rank grass, compost heaps, or under rocks, logs and other debris	Low
<i>Oligosoma zelandicum</i>	Glossy brown skink	At Risk - Declining	Occur in a wide range of habitats including coastal areas near the high tide mark, in coastal pebble banks, grassland, wetland, dense scrubland, mature forest with dappled sunlight, and will also live in suburban gardens with sufficient ground cover. Glossy brown skinks show a preference for somewhat damper microhabitats	Moderate
<i>Oligosoma ornatum</i>	Ornate skink	At Risk - Declining	Inhabit forested areas, shrubland and heavily vegetated coastlines; they are often found amongst leaf litter, in dense low foliage, thick rank grass and under rocks or logs, and are known to occupy small burrows	Low

Appendix 3: Habitat plates



Plate 3. Low quality post-mulched rank grass habitat on the central dune system.



Plate 4. Low lizard quality pasture habitat (foreground). Moderate quality exotic scrubland habitat (background), which is part of the lizard release area, on the dune leeward slopes.



Plate 5. Example of the structurally complex high quality lizard habitat comprising a pōhuehue (*Muehlenbeckia complexa*) population in the central dune system. This habitat type supports the highest densities of northern grass skink on the site.



Plate 6. Central dune leeward slopes covered in moderate quality lizard habitat. Most of the leeward slopes are outside of the earthworks proposal and part of the lizard release area.