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Southern Seawall Remediation

Lizard Management Plan

for: Wellington International Airport Ltd.

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TABLE OF CONTENTS

List of Tables

List of Figures

1 INTRODUCTION

This Lizard Management Plan (LMP) has been prepared for Wellington International Airport Limited's (WIAL) Southern Seawall Renewal Project (the Project). The Project will involve the removal of identified lizard habitat within its footprint, particularly at construction and laydown yards at Moa Point (Moa Point works site) and Miramar Golf Course Yard (MGC Yard).

The Ecological Impact Assessment (EcIA, Bioresearches 2025) assessed lizard habitat values within the Project as being low value at MGC Yard (rough exotic grass supporting Northern grass skink, *Oligosoma polychroma*), and Moderate value at Moa Point (semi-natural coastal vegetation supporting Northern grass skink and Raukawa gecko, *Woodworthia maculata*). A low magnitude of impact is expected from the removal of the habitats, resulting in an overall low level of effect.

The clearance of vegetation would be expected to result in mortality or harm to the identified native lizards, and/or displacement into adjacent environments. The EcIA identifies that the overall construction programme will take approximately six to eight years, after which:

1. the potential lizard habitats occupied by the Moa Point works site would be remediated with indigenous vegetation and
2. the potential habitats around the MGC Yard would be buffer planted with indigenous vegetation.

Native reptiles are legally protected under the Wildlife Act (1953) and authorisation is sought under the Fast-Track Approvals process to relocate wildlife (native lizards) to adjacent enhanced environments to avoid mortality or significant harm. This LMP applies to the wildlife approval and to the resource consents for the Southern Seawall Project. The information requirements under the Fast-track Approvals Act in respect of wildlife approval to capture and relocate lizards are set out in the Terrestrial and Freshwater Ecology Report, and for ease of reference are appended to this LMP (See Appendix A).

The purpose of this LMP is to detail the management methods required to minimise adverse effects on native lizards associated with vegetation and habitat removal at site establishment. These methods include preclearance trapping, systematic and destructive searches, and habitat enhancement to support the capacity of receiving habitats.

1.1 Lizard Habitats

The Project requires two construction Yards – at Moa Point works site and the MGC Yard – which each support relatively small areas of rough perimeter grassland (MGC Yard) and coastal shrubland. In addition, a fenced kororā sanctuary is proposed to the south-east of the Moa Point works area ('Stage 1' kororā colony) (Figure 1). A laydown area will be established at each location while the Southern Seawall is reconstructed at the Moa Point works site. The project is estimated to take between six and eight years to complete. The Southern Seawall construction is estimated to take 24-30 months within the six to eight year period. The two works areas are described below.

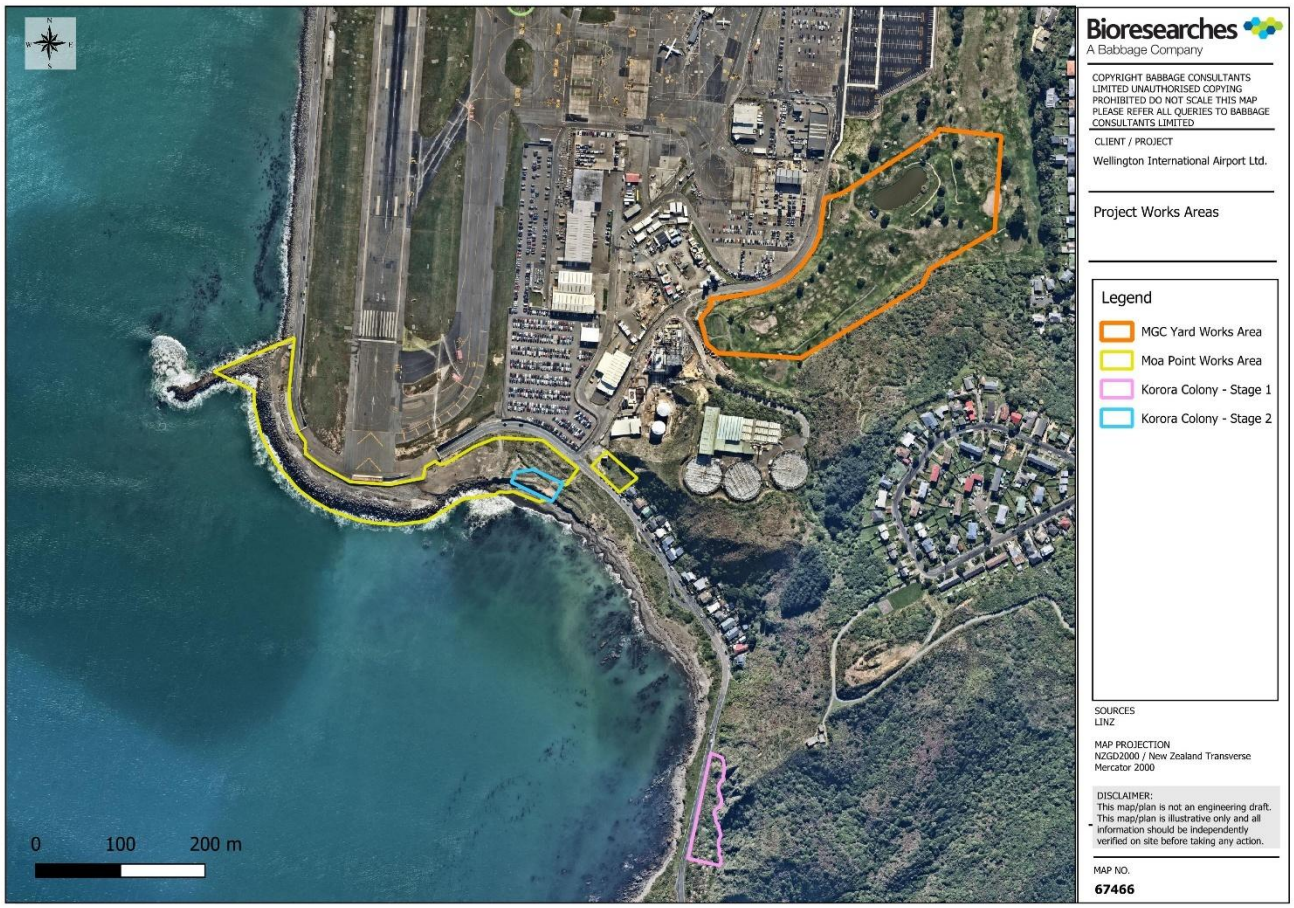

Figure 1. Overview of Project Works Areas; Moa Point works area includes laydown yard, eastern bank remediation, seawall works area, and two kororā colonies.

1.1.1 Moa Point

The Moa Point works site is located along the southern coastal margin of Wellington International Airport and is the site for seawall renewal works and supporting works, and will include the following works:

- Reinforcement and replacement of the southern seawall rock armour with a formal seawall;
- A laydown yard;
- Construction access north and east of the seawall;
- Stage 1 kororā sanctuary;
- Remediation of the Eastern Bank to protect it from existing and ongoing erosion; and
- Stage 2 kororā sanctuary.

To facilitate this construction, removal of approximately 0.5 ha of coastal vegetation, including rough grass (Figure 2), which comprises habitat for Northern grass skink and Raukawa gecko. Native lizard habitat on site includes rock piles, rough grass, logs, infill debris, and occasional flaxes, sedges and succulents. Note that although the Stage 1 and 2 kororā sanctuaries are included in the list of works areas, they are not subject to the LMP. The stage 1 sanctuary will only require small amounts of vegetation disturbance for nest box placement and implementing penguin paths, so lizard salvage will not be required. The stage 2 sanctuary will be implemented after the completion of construction, so it is not expected that any lizards will be present in the construction area post works.

While both species would have formed a component of a more diverse coastal Wellington lizard community of at least seven indigenous species (excluding a few additional species that are no longer present on mainland Wellington, but would also have contributed to a much higher diversity), they are representative of a typical Wellington coastal environment. It is considered that up to five other native lizard species remain potentially present (coastal environments can support higher lizard diversity), the apparent lizard diversity, following site assessment and survey, is low.

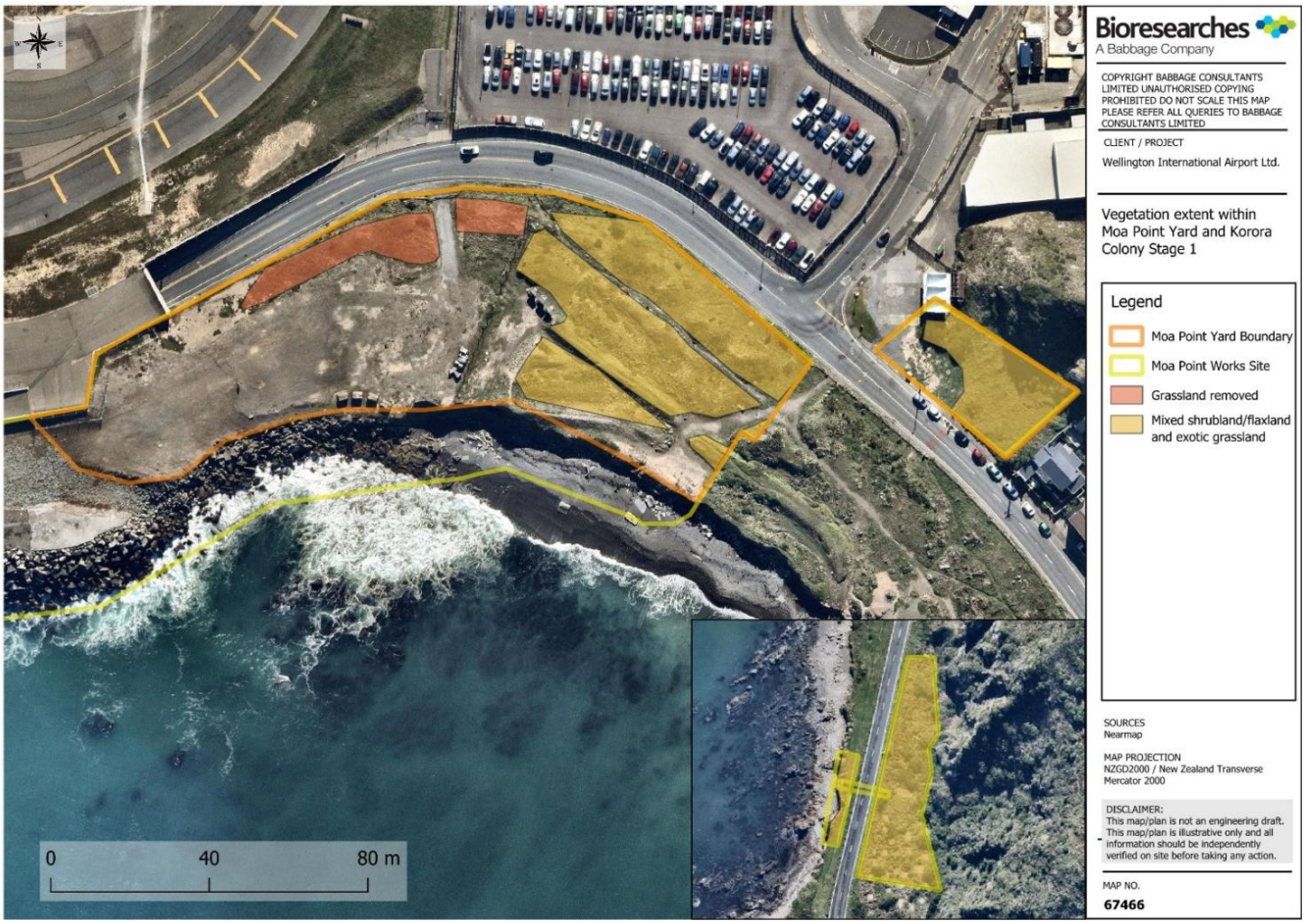

Figure 2. Mixed shrub and grassland within the Moa Point Construction Yard. Inset shows proposed kororā sanctuary.

1.1.2 MGC Yard

The Miramar Golf Course is located directly east of Wellington International Airport and the MGC Yard will be the primary storage facility and associated works yard for rock and armour units required for the seawall construction. The MGC Yard site is approximately > 4.5 ha and proposed works on Site include earth works and establishment of features and facilities that would require the removal of potential lizard habitat.

Potential habitat on site includes rough grassland on the edges of the golf course. Assuming removal of all vegetation within the MGC Yard's boundary, the Project will require vegetation removal of approximately 0.67 of exotic rough grassland. Potential lizard habitats at the MGC Yard are considered to have moderate ecological value for native herpetofauna (in terms of the areas of rank grassland and karo treeland and scrub) (Bioresearches, 2025).

This vegetation supports northern grass skink (detected on Site; Bioresearches, 2025), and Raukawa gecko are also considered highly likely to be present.

Figure 3. Rough grassland within the MGC Yard

1.2 Objectives

The objective of this LMP is to minimise potential adverse effects on native lizards within the construction footprint, by way of capturing and relocating any indigenous lizards during vegetation/habitat removal, and providing habitat enhancement and pest control, where appropriate. Further, this LMP aims to achieve the following:

- The population of each species of native lizard present on the site at which vegetation/habitat clearance is to occur (impact site) shall be maintained or enhanced, at an appropriate alternative site; and
- The habitat(s) that lizards are transferred to (release site) will support viable populations for all species present pre-clearance.

These objectives will be achieved by:

- Using current best practice to capture native lizards from vegetation in the footprint during vegetation clearance and relocation of any captured individuals to safe and suitable habitats;
- Applying recognised surveying and monitoring protocols that are to be followed, using the Department of Conversation's (DOC) Natural Heritage Management System's Herpetofauna Inventory & Monitoring Toolbox and / or using new advances in tools and techniques not yet incorporated into the toolbox; and

Meeting requirements of the Wildlife Act 1953, Resource Management Act 1991 and Fast-track Approvals Act 2024.

This LMP addresses the following:

- A summary of the affected habitats and species covered by the plan;
- Capture and relocation procedures;
- A summary of the recommended release sites;
- Timing of the implementation of the LMP;
- Habitat enhancement at receptor site(s);
- Post-works management and monitoring (where required); and
- If triggered, lizard management/vegetation removal reporting and monitoring protocols.

This LMP only addresses management actions for native lizards protected under the Wildlife Act 1953. Exotic species (e.g. plague skink, a listed 'Unwanted Organism' under the Biosecurity Act 1993) are excluded from all management actions described in this LMP.

1.3 Statutory Context

Herpetofauna (reptiles and amphibians) comprise a significant component of New Zealand's terrestrial fauna, and more than 85% of the 135 taxa have a conservation status of 'Threatened' or 'At Risk' (Hitchmough et al., 2021). All native reptiles and amphibians are legally protected under the Wildlife Act 1953 and subsequent amendments, and vegetation and other features that provide significant habitat for native herpetofauna are specifically recognised by section 6(c) of the Resource Management Act 1991 and by the National Policy Statement for Indigenous Biodiversity.

Statutory obligations require management of protected reptile and amphibian populations where they or their habitats are threatened by land-use changes. Management recommendations are usually addressed in an LMP such as this, which provides a site-specific plan to avoid or minimise adverse construction effects and to ensure that all necessary measures for successful relocation are identified and implemented to protect and/or enhance their habitats.

This LMP may only be implemented under a valid Wildlife Act Authority, issued by the Department of Conservation (DOC) to a suitably qualified herpetologist. Authorisation is sought under the Fast-Track Approvals process to relocate wildlife (native lizards) to adjacent enhanced environments.

1.4 Implementing Herpetologist

This LMP must be actioned under a valid Wildlife Act Authority, issued by the Department of Conservation (DOC). The Implementing Herpetologist (Project Herpetologist) (Table 1) is responsible for ensuring key components of the LMP are implemented as per Table 2.

Table 1 Details of Project Herpetologist

Credentials of Project Herpetologist	
Project Herpetologist	Chris Wedding
Credentials	M.Sc.; 20 years herpetological experience

Table 2. Lizard Management Plan Checklist

Project Start-Up	Required of:	Completed
Lizard Management Plan	Approved under the Fast Track Approvals process.	
Pre-Works Lizard Management (Moa Point Yard and MGC Yard)		
Five-day trapping (minimum 80 traps per site)	Project Herpetologist	
Provision of habitat enhancement (supplementary refuges)	Project Herpetologist	
During-Works Lizard Management (Moa Point Yard, MGC Yard & Stage 1 Colony)		
Machine-assisted habitat searches	Project Herpetologist, clearance contractor	
Provision of habitat enhancement (supplementary refuges)	Project Herpetologist	
Post-Works		
As triggered: Enhancement Planting	Contractor / WIAL	
As triggered: Supplementary Pest Control	Contractor / WIAL	
As triggered: Relocation success Monitoring	Project Herpetologist	
Works completion report to client, council, and DOC	Project Herpetologist	

1.5 Key Principles for Lizard Salvage and Transfer

The Department of Conservation's Key principles for lizard salvage and transfer in New Zealand guidelines (DOC Lizard Technical Advisory Group, 2019) require consideration of the following nine guidelines when selecting a receiving site (Table 3). These matters are addressed below, with reference to the EcIA and/or this LMP (as relevant), as set out in the table below.

Table 3. Nine principles for lizard salvage and transfer in New Zealand

Principle #	Principle	Location of information
1	Lizard species' values and site significance must be assessed at both the impact (development) and receiving sites.	Lizard species' value and significance within the development sites – Section 4 of the **EcIA:** Moa Point: **Section 4.1.6** MGC: **Section 4.2.4** Lizard species' value and significance within the receiving sites – Section 4 of this **LMP**: Moa Point: **Section 3.1.1** MGC: **Section 3.1.2**
2	Actual and potential development-related effects and their significance must be assessed.	Section 5 of the **EcIA:** Moa Point: **Section 5.2.3** MGC: **Section 5.3.3**
3	Alternatives to moving lizards must be considered.	Current location has lowest impact (Golf course and mostly bare earth hardfill dump)
4	Threatened lizard species require more careful consideration than less-threatened species.	No Threatened species are assessed as having potential to be present, however At-Risk species are: Moa Point **Section 4.1.6 of EcIA** MGC Section **4.2.4 of EcIA** At both locations, this potential is recognised with a low value for MGC, and a moderate value for Moa Point for the affected habitats.
5	Lizard salvage, transfer and release must use the best available methodology.	**Section 2.2 of this LMP** applies multi-tool approach using to DOC biodiversity toolbox methods (trapping, systematic searches) and including destructive searches, undertaken prior to, during and post vegetation removal works. Release site is pest managed, however additional release site enhancement methods are provided in Section 5 of this Plan.
6	Receiving sites and their carrying capacities must be suitable in the long term.	**Section 4 of this LMP** Short-term carrying capacity stress is considered (large numbers of Not-Threatened species expected). Long-term recolonization of restored and enhanced habitats would be facilitated.
7	Monitoring is required to evaluate the salvage operation.	**Section 3.2 and 4.3 of this LMP** identifies monitoring methods and objectives
8	Reporting is required to communicate outcomes of salvage operations and facilitate process improvements.	**Section 5 of this LMP**
9	Contingency actions are required when lizard salvage and transfer activities fail.	**Section 6 of this LMP**

1.6 Lizard Species Covered by Plan

The indigenous herpetofauna of the Wellington Region includes 16 terrestrial lizard species, of which 12 are considered to be extinct on the region's mainland (c.f. islands and sanctuaries) (Crisp et al., 2023). According to Bioresearches (2025), nine species of native herpetofauna have been recorded within 5km of the Project area (Table 4).

Of these, it is unlikely that Ngahere gecko and Wellington green gecko occur within the Project area, as both these species are predominantly arboreal and there is no contiguous forest habitat within either site where they would be expected to be found. Two Raukawa geckos have been recorded at Moa Point Beach, indicating that there may potentially be others occupying the area. High densities of northern grass skink have also been recorded from within the vicinity of the Project area and are likely to be found within rank grass at both sites.

The protocols in this LMP cover, but are not limited to, the indigenous lizard species listed below.

Table 4. Terrestrial herpetofauna found within 5km of the project area.

Common name	Scientific name	National threat[1] status	Regional threat status[2]
Brown skink	*Oligosoma zelandicum*	At Risk - Declining	At Risk - Declining
Copper skink	*Oligosoma aeneum*	At Risk - Declining	Threatened - Critical
Ornate skink	*Oligosoma ornatum*	At Risk - Declining	At Risk - Declining
Northern spotted skink	*Oligosoma kokowai*	At Risk - Relict	At Risk - Recovering
Northern grass skink	*Oligosoma polychroma*	Not Threatened	Not Threatened
Minimac gecko	*Woodworthia* "Marlborough mini"	At Risk - Declining	At Risk - Uncommon
Raukawa gecko	*Woodworthia maculata*	Not Threatened	Not Threatened
Ngahere gecko	*Mokopirirakau* "southern North Island"	At Risk - Declining	At Risk - Declining
Wellington green gecko	*Naultinus punctatus*	At Risk - Declining	Threatened - Vulnerable

1.7 Lizard Survey

From the 2nd to the 8th of April 2025, a lizard survey was conducted within both the works areas at Moa Point and the MGC Yard as well as within the adjacent release site habitats (see Section 3, Figure 13 for details of release Site) (Bioresearches, 2025). Visual encounter searches were undertaken at both sites, and tracking tunnels were set with ink cards, a banana lure, and left in situ for six days. The tunnels and systematic searches covered potential ground cover habitats both inside the works footprint, and where such vegetation extended beyond.

[1] Hitchmough et al, 2021.
[2] Crisp et al., 2023.

A total of 26 tracking tunnels were installed in between the Southern Seawall and the Hue te Taka peninsula at Moa Point (Figure 4), and 22 tracking tunnels were installed along the southern margins of the Miramar Golf Course (Figure 5).

At the end of the six days, the equipment was collected and analysed for footprint analysis. Snail damage compromised some tracking cards and is likely to have underrepresented lizard presence. The following was recorded:

Moa Point (26 cards): Skink prints identified at 8/26 cards along the Moa Point coastline and on both sides of Moa Point Road. No prints recorded at the Seawall itself. One gecko print recorded at Moa Point Beach, beyond the footprint.

MGC Yard (22 cards): Skink prints identified at 5/22 cards, both within the works area at the southern rough grass edge and along the contiguous grass edge beyond the Yard.

Visual encounter searches along Moa Point identified that northern grass skinks were visually abundant along the coastline, on both sides of the road and where dense grass occurred. Four Raukawa geckos (as well as their shed skins) were observed, at the location of the kororā sanctuary, and the south-eastern end of Moa Point Beach (beyond the Moa Point Works area). Lizards were not observed in grasses at the MGC edges.

The survey did not identify any other species of lizard. While other species cannot be ruled out, they are considered less likely to be present given the extensive survey effort.

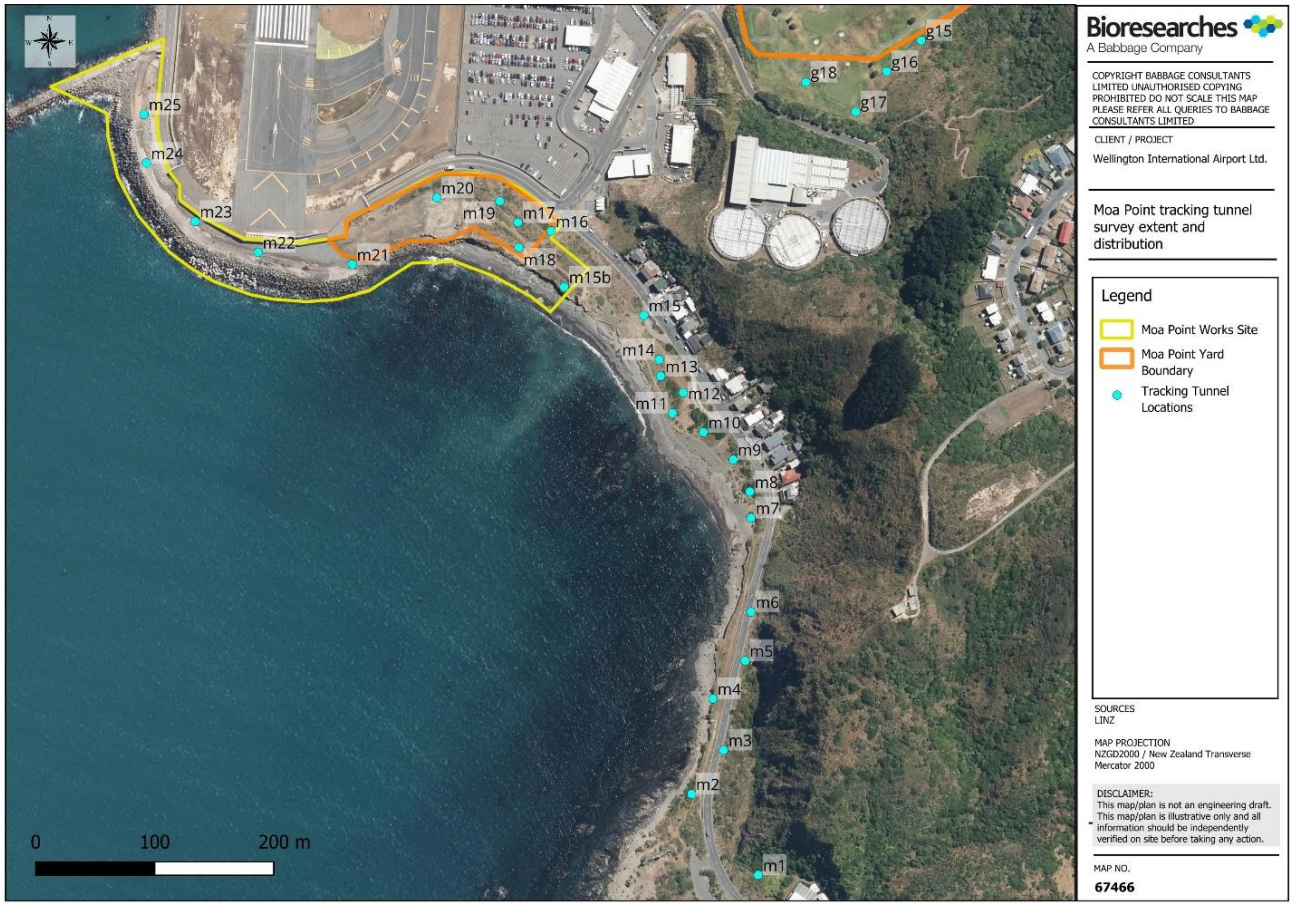

Figure 4. Moa Point Tracking tunnel survey extent and distribution

Figure 5. Miramar Golf Course Tracking tunnel survey extent and distribution

2 LIZARD SALVAGE AND RELOCATION PROTOCOLS

To minimise adverse effects on any native lizards within the works footprint, management activities include both pre-clearance systematic searches[3] and trapping and destructive searches during vegetation clearance. Activities such as release site habitat enhancement and triggers for release site monitoring are detailed in section 3.2 and Table 5. Information is based on the DOC Lizard Technical Advisory Group (2019) principles for lizard salvage and transfer in New Zealand.

This Plan requires habitat searches undertaken or supervised by the Project Herpetologist, prior to and during vegetation removal. All relocated native lizards shall be released into habitats that are enhanced, in accordance with this LMP. To increase the carrying capacity of the release site, shelter/refuge provision will be provided with all lizards relocated.

2.1 Timing of the Salvage and Relocation

All lizard capture and release shall be undertaken:

- Immediately prior to (within three days, or five days for trapping), and during vegetation removal; and
- Within the accepted North Island 'lizard salvage season' (October to April, inclusive).

This timing covers both lizard trapping / searches and any associated habitat removal. The specific timing of the lizard salvage will depend on the timing of the proposed habitat clearance works.

2.2 Works Management

2.2.1 Demarcation of works footprint

Prior to any vegetation clearance or habitat disturbance on-site, all works areas will be clearly demarcated to ensure that works do not encroach into peripheral undisturbed or protected habitat areas.

2.2.2 Pre-construction survey at the Southern Seawall

Although no lizards were detected in tracking tunnels at the Southern seawall, an additional survey will be undertaken immediately prior to construction commencing. This will provide further confidence that no lizards are present within this area.

If lizards are detected, then the pre-clearance searches and trapping will apply to this area as well. However, note that salvage of lizards during construction or dismantling of the existing seawall will not be possible, due to health and safety risks.

If no lizards are detected, but lizards are found to be present during construction by on-site workers, the accidental discovery protocol will be used (see section 2.3.2 for further details).

2.2.3 Pre-clearance systematic searches

Prior to the commencement of any vegetation clearance or earthworks, a herpetologist(s), or ecologist under the herpetologist's supervision, will carry out a search-and-salvage operation. This will involve

[3] https://www.doc.govt.nz/documents/science-and-technical/inventory-monitoring/im-toolbox-herpetofauna-sytematic-searches.pdf

active searches for lizards in all identified habitats within the clearance footprint (Figure 1). Manual searches for lizards through debris piles and vegetation across the site will also be undertaken.

Systematic searches will be carried out during the day (diurnal). Systematic searching is a standard technique for detecting both diurnal and nocturnal lizards in New Zealand (Lettink & Hare, 2016).

These searches will be carried out within three days preceding the scheduled vegetation clearance date(s); and will target all native reptile species using systematic searching of potential habitats.

All captured lizards will be processed (measured, weighed, and photographed) and relocated to the chosen relocation site in accordance with this LMP.

2.2.4 Trapping

Lizard trapping will also be undertaken during the five-day period before vegetation removal. The requirements for trapping are as follows:

- **Moa Point trap density** shall achieve a minimum of 80 trap locations, including use of (where practicable) pitfall traps[4], and / or funnel traps (Figure 6).
- **MGC Yard trap density** shall achieve a minimum of 80 trap locations at MGC Yard, including use of (where practicable) artificial retreats[5], and / or pitfall traps[6], and / or funnel traps (Figure 6).
- Note that artificial retreats should not be used at Moa Point, due to potential for high wind at this location and hazards to the airport by foreign object debris.
- All pitfall traps shall be embedded in, and furnished with vegetation to protect any captured lizards from heat and exposure during confinement.
- Pitfall traps shall be baited with banana, pear or similar lizard attractant.
- When not in use, all pitfall traps shall be sealed closed (so that no lizards can be captured), or furnished to the upper rim so that lizards may escape.
- All traps shall be checked no more than 24 hourly while active.

[4] https://www.doc.govt.nz/globalassets/documents/science-and-technical/inventory-monitoring/im-toolbox-herpetofauna-pitfall-trapping.pdf

[5] https://www.doc.govt.nz/globalassets/documents/science-and-technical/inventory-monitoring/im-toolbox-herpetofauna-artifical-retreats.pdf

[6] https://www.doc.govt.nz/globalassets/documents/science-and-technical/inventory-monitoring/im-toolbox-herpetofauna-pitfall-trapping.pdf

Figure 6. Artificial retreat (AR; top left); pitfall trap beneath AR (top right); Funnel trap (bottom left); gecko in funnel trap (bottom right).

2.2.5 Machine searches during vegetation removal

Machine-assisted destructive searches require the vegetation removal contractor to work with the Project Herpetologist to search through vegetation as it is removed. This involves scraping back of surface vegetation (Figure 7) as well as lifting heavy objects (e.g., large logs) so that lizards hiding beneath can be captured. An excavator with a toothed bucket or root-rake attachment will be required for this work in the presence of the Project Herpetologist.

Recoverable habitats, such as logs, will be collected and transferred to the lizard relocation site(s) where practicable. Some material transfer may require machine assistance

Figure 7. Machine-assisted lizard searches: in terrestrial vegetation (left) and cobble rock habitat (right).

2.2.6 Lizard Capture

Native lizards will be captured and handled by a DOC-authorised herpetologist (i.e., Project herpetologist) or by an ecologist under their supervision. All native lizards captured prior to and during vegetation clearance operations will be placed immediately into containment boxes and held temporarily for release. Captured lizards will be measured, sexed, weighed and photographed (geckos), and then immediately released at the designated release site.

2.2.7 Post Works

A final inspection (post-works search) of the cleared area will involve the search and recovery of any remaining lizards by the Project Herpetologist after habitat clearance and relocation to the approved site (Figure 8). Searches will be completed until the Project Herpetologist is satisfied that no habitats remain within the Project footprint or that all affected areas have been thoroughly searched.

Figure 8. Post-works searching of clearance area.

2.3 Incidental Discovery

2.3.1 Species not listed in Plan

In the very unlikely event that a native lizard is found in the footprint that is not listed in Table 4 of this Plan, the species will be retained in temporary captive management, and the Department of Conservation will be notified. Note that incidental discoveries would be considered notable because those not listed in Table 4 are likely to include species outside their known range, and/or are threatened species and potentially not covered under the Wildlife Act authority.

2.3.2 Lizards identified when Project Herpetologists are not on site

If a native lizard is observed within the Project footprint when the Project Herpetologist is not present on site, the contractor(s) should note down a description of the lizard and its location and contact the Project Herpetologist. The Project Herpetologist will either attend the site to try and capture the lizard or provide advice on how to continue working in the area without risking harm to the lizard. The Project Herpetologist will brief project contractors on these protocols prior to the start of the works (e.g., at the pre-start meeting).

2.3.3 Southern Seawall – Accidental Discovery Protocol

Should lizards be observed on the Southern seawall during construction, when they have not previously been detected in preconstruction surveys, an accidental discovery protocol will be put in place. If no lizards are found in initial surveys, but a substantial number (i.e. 5+) of native lizards are discovered during construction, then a salvage may be undertaken. However, we note that it will not be safe to have an ecologist on the seawall during the works, so the salvage can only occur when construction activity is not

active. As such, the salvage will only consist of pitfall traps, not an ecologist manually catching and salvaging lizards.

3 RELEASE SITES

Direct transfer of salvaged lizards from the impact site to a receiving site is preferred wherever possible, and the selection of an appropriate lizard relocation site is crucial to ensuring the best possible outcome for lizard salvage-relocation programmes. The retention of fauna habitat within or adjacent to the Project area is always preferred, as it maintains local biodiversity and reduces the potential effects associated with longer distance relocations (e.g., stress during transfer periods, homing phenomena). There are also cultural considerations for minimising distances that any lizards may be moved.

3.1 Release Site Assessment

This LMP provides for the release of native lizards directly into existing adjacent habitats to each construction area (MGC Yard and Wahine Memorial Park, Figure 13). It is expected that remediation works following completion of construction activities at each location would facilitate natural recolonization by affected species.

3.1.1 Wahine Memorial Park, Tarakena Bay (Release site for Moa Point works site)

Wahine Memorial Park is approximately 1.7 km to the east of the Moa Point works site but supports habitat that is contiguous with sites at Moa Point affected by the works, and is also situated further along Moa Point Road, along Wellingtons southern coastline (Figure 9). This site was identified by Wellington City Council in preference to previously identified adjacent habitats, and provides habitats that support the same indigenous lizard communities, and opportunities for restoration planting (Section 3.2, Table 5).

Throughout the Park, there is extensive lizard habitat in the form of low-stature coastal scrub comprising rough grass and sedges, pohuehue (*Muehlenbeckia complexa*), taupata (*Coprosma repens*) and whaririki (*Phormium cookianum*) (Figure 10), within which both grass skink and rauakawa gecko were observed (Figure 11**Error! Reference source not found.**). Though the park currently provides suitable lizard habitat, there are several areas of open grassland that could present opportunities for restoration planting, and habitat enhancement to increase the extent of available lizard habitat. If more than 20 lizards, or any 'At Risk' species, are translocated to Wahine Memorial Park, it is recommended that 850 m^2 of restoration planting be undertaken to support an increase in the sites carrying capacity and to enhance the parks biodiversity values, as outlined in Table 5 and further described in Section 4.2.

Wellington City Council approval would be required as the landowner, however it is noted that this site was proposed by Wellington City Council. It is noted that Predator Free Wellington and Predator Free Miramar currently provides for maintaining Miramar Peninsula as possum, rats and stoat free, noting that Wellington Airport provides a physical barrier to reinvasion within this area. Hedgehogs, feral, stray and domestic cats, and mice are currently present within the Miramar Peninsula, which could be targeted if additional pest control is triggered as per Section 4.3.

Figure 9. An overview of the proposed release site: Wahine Memorial Park

Figure 10. Examples of the habitat at the Wahine Memorial Park release area.

Figure 11. Northern grass skink and Raukawa gecko at Wahine Memorial Park, Tarakena Bay

3.1.2 Southern Miramar Golf Course (Release site for MGC Yard):

At the southern end of the Miramar Golf Course property is a hill covered with karo treeland, low, dense ground cover grasses and scrub that backs onto the Tukanae Street Reserve (Figure 12). This land is within WIAL's existing East Side Area designation and is retained under that designation as a landscape buffer.

This exotic grass and scrub-type habitat is also present where works are currently underway with the adjacent Te Whare Wai Para Nuku Sludge Minimisation Facility. As part of those works, large numbers of northern grass skinks and Raukawa geckos were relocated from the impacted areas. No other lizard species were detected. Given the close proximity of these works and with similar habitat impacted, it is expected that both these species would also be present within the Southern Miramar Golf Course. During the lizard survey, it was noted that northern grass skinks were numerous within the habitat of the MGC Yard. Of the 22 tracking tunnels deployed around the MGC Yard, 5 detected skinks.

Temporary lizard exclusion fencing may need to be erected for the duration of the Project works to prevent lizards from re-entering areas of active development. It is noted that Predator Free Wellington currently provides for maintaining Miramar Peninsula as possum-free, and manages and monitors rats and stoats effectively, noting that Wellington Airport provides a physical barrier to reinvasion within this area. The Southern Miramar Golf Course release site is shown in pink in Figure 13 and in Figure 14 below.

Figure 12. Examples of habitat at the Miramar Golf Course release site

Figure 13. Map showing the location of proposed release sites within WIAL land adjacent to Rangitatau Reserve, and at Wahine Memorial Park.

Figure 14. Close up aerial view of the habitat, within WIAL land, adjacent to the works site in the Miramar Golf Course release area.

3.1.3 Kororā colony stage 1

During the establishment of the stage 1 kororā colony, some localised vegetation clearance may be necessary for the installation of nest boxes and kororā paths. During this process, an ecologist is required on-site to capture and handle any affected lizards. However, all lizards will be released back into suitable habitats at the same site. As such, no salvage and relocation of lizards is required.

3.2 Release site post-release management

This Plan acknowledges that the proposed release sites may already support the full suite of species covered under this Plan. Displaced lizards have a lower likelihood of survival where the carrying capacity of adjacent habitats is stressed through increased competition for fewer resources. Further, displaced animals have a higher probability of risk of predation, and a rapid increase in lizard numbers in a given area could result in a corresponding increase in predators. As part of the requirements of this LMP, habitat enhancement and, potentially predator control (acknowledging a level of pest management is currently provided by Predator Free Wellington) will be undertaken in the proposed release areas to increase suitability and likelihood of survival for relocated lizards.

Management triggers (adaptive management) have been identified to ensure appropriate response actions are undertaken that are commensurate to lizard values (number of lizards) recovered under this Plan. The triggers for specific additional actions are presented in Table 5.

Table 5. Triggers for management and post-release monitoring provisions. Refer Section 5 for detail on supplementary refuges, restoration planting and pest control actions.

	Trigger	Required Action	Duration of management
A	< 20 native lizards	-Provision of supplementary refuges for each lizard (MGC Yard).	N/A
B	≥ 20 native lizards or: Any At-Risk or threatened species	-Wahine Memorial Park: Restoration planting of 850 m^2 over bare ground or rough grass areas at Wahine Memorial Park. -Pest management -Post-management monitoring -Annual reporting	Construction duration + 5 years following habitat remediation, supplementary pest control to cease five years after rehabilitation is complete.

4 RELEASE SITE ENHANCEMENT

Supplementary refuges are provided for all lizards as part of this LMP, and additional pest control is triggered in response to high lizard numbers (Table 5). These release site habitat enhancement actions are detailed below. Previous records and data from the lizard survey show that there are already established populations of both skinks and geckos within the release sites (Bioresearches, 2025). Introducing other lizards relocated from the works areas would increase competition for resources within the release site locations. Supplementary refuges provide additional habitat for both lizards and the invertebrates that lizards predate on, thus reducing competition pressure on the resident animals within the release sites. Pest control would further reduce pressures on both resident and relocated lizards.

4.1 Supplementary Refuges (MGC Yard)

For the first lizard released and every five lizards thereafter, at least one supplementary refuge comprising of at least 0.5m x 0.5m area of small, stacked logs, brush or rocks shall be created within the lizard release area at MGC, where existing release habitats are currently dominated by grasses.

The material used to create these piles will be sourced from the area of vegetation/rocks to be cleared from the works areas, such as amenity trees felled from the Miramar Golf Course.

When constructing the supplementary refuges, material (not already providing habitat to lizards outside the footprint) to be used should include:

- Woody material from within the works area;
- The woody material shall be from native species, or non-weedy exotic species that are not likely to root or grow (e.g., no material should be used from poplar or willow trees); and
- Amenity trees can be sectioned or cut into log discs that can then be used as a base layer, for habitat complexity and invertebrate food source provision[7] (Figure 15).

4.2 Enhancement Planting (Wahine Memorial Park)

At Wahine Memorial Park, organic and rocky debris is less available than within the project footprint (and should not be removed where it provides habitat for resident lizards), therefore an additional 850m^2 of coastal restoration would be undertaken within existing areas, subject to the agreement with Wellington City Council, where triggered by relocating more than 20 lizards from the Moa Point Yard, or any ‘At Risk’ species. Large areas of bare ground (e.g. Figure 16) or low complexity (rough, exotic grass) habitat would support increased lizard numbers as plantings mature and improve habitat complexity. Plantings would provide additional coastal restoration benefits and minimise public trampling through exotic grass areas. Plantings would be in addition to remediation Plans following Seawall construction, and beyond the area identified by the Project as Kororā Sanctuary 2 (e.g. Figure 17).

[7] https://www.doc.govt.nz/globalassets/documents/about-doc/concessions-and-permits/wildlife-research-permits/guidance-on-impacts-of-vegetation-clearance-on-lizards-nz.pdf

Table 6. Indicative Coastal planting schedule (list to be finalised with Wellington City Council) and recommended composition

Species	Spread	composition
Coprosma acerosa ('red rocks')	Plant in groups	20%
Coprosma repens	Plant in groups	20%
Coprosma propinqua	Spread out	20%
Phormium cookianum hookeri	Spread out and in clumps of 2-4	20%
Muehlenbeckia complexa	Spread out	20%

Figure 15. Example of sectioned logs placed in rough grass to enhance lizard habitat- suitable for enhancement at MGC.

Figure 16. Large areas of bare ground at Wahine Memorial Park could support restoration planting.

Figure 17. Areas of bare or rough exotic weeds and grasses at Wahine Memorial Park could be restored with indigenous coastal planting to enhance lizard habitat values (areas identified with Wellington City Council).

4.3 Pest Control

Predator Free Wellington and Predator Free Miramar have engaged in intense pest control on the Miramar Peninsula, having removed all Norway rats, ship rats, and mustelids from the peninsula by November 2023. To prevent re-incursions of these species, these organisations maintain trap networks, with a trap set up every 75-100 square metres. The removal of these species from the area is of great benefit to lizards as these pests are significant predators and suppress lizard population numbers.

There are however still pest species present on the peninsula that may predate on lizards, including hedgehogs, cats, and mice. The implementation of finer scale pest management around the release sites of any lizards salvaged would be expected to provide for increased capacity, for the duration of construction, and until rehabilitation of the construction yards is completed.

Supplementary pest control shall be initiated at a release site where ≥ 20 native lizards are released at that location (i.e., no pest control triggered if 15 are released at one site and 10 are released at the other). In order to target species such as mice and hedgehogs, higher-density trapping would be undertaken, involving traps / pest stations set at 25m spacing. Pest control shall be operational for the duration of the works, and for five years after completion of works and of restoration works. The following parameters will apply to pest control:

- Pest control shall be operational within ten working days of the threshold for pest control (above) being triggered.
- Pest control would be achieved over four pulses each year. Each pulse would consist of a four-week period, in August, November, January and April.
- Pest control shall involve maintained rodent bait stations or suitable self-resetting humane traps set at 25 x 25 m spacing
- While it is acknowledged that reinvasion of pest mammals will be constant over the period of pest management, this is expected to be reduced due to pest suppression ongoing over the wider landscape.
- During each pulse period:
    - Bait stations and manual traps would be checked weekly and rebaited/reset as required.

  Bait stations shall be baited with Bromadiolone during pulses in August, November, January and April. Bromadiolone is an effective single feed toxin and is less labour intensive than Diphacinone and has lower potential for accumulation of the toxin in the environment than second-generation toxins, such as Brodifacoum.

4.3.1 Pest Control Monitoring

A report on bait take/replacement and trap captures is to be provided to Wellington City Council and the Project Herpetologist for each pulse.

4.4 Relocation Success Monitoring

Success monitoring is triggered if ≥ 20 native lizards are captured and relocated from a worksite. Where required, success monitoring would be undertaken at release site locations, targeting supplementary refuges, where lizards are relocated. The purpose of the monitoring is to determine success by measuring/identifying:

1. Occupancy by lizards of supplementary refuges, as provided for habitat replacement.
2. Identifying any relocated lizards, where photograph ID is used.
3. Recording any trends in numbers and species encountered within the pest managed area.
4. Presence of gravid females or juveniles.
5. Demonstrating recovery of lizards into rehabilitated/remediated environments.

Monitoring for geckos and skinks would consist of stations of four artificial retreats and / or pitfall traps. Each type of monitoring station will be set at a minimum of four locations (based on triggers in Table 5) targeting locations of supplementary refuges. Where artificial retreats are used, they would be installed at least four weeks before survey period (noting these methods will not be used where there is a risk of foreign object debris and care will be taken to avoid hazards associated with foreign object debris (FOD)). Pitfall traps may be left in situ between survey years. However, they must be neutralised with either an impenetrable cover, or filled to ensure any lizards can climb out between survey years. The monitoring period would provide for four trap inspections during fine, non-consecutive days over November-December or March-April, when lizards are most active. Artificial retreat survey/monitoring would be undertaken per Lettink (2012).

5 REPORTING

Reporting is important for ensuring compliance with plans, promoting transparency and accountability, and identifying areas for improvement. For this reason, monitoring existing lizards without the ability to determine individual animals, has little value. Therefore, success monitoring will be measured by demonstration of recolonization of rehabilitated habitats following completion of site works. The following reports are required for lizard management and monitoring:

Lizard Management / Vegetation Removal Report: Outcome of lizard management, including:

a. For each native lizard, the following information will be recorded:
   i. Species and demography (assessed as male/female/juvenile)
   ii. Method of capture (trapping phase or machine search)
   iii. Location of capture (Moa Point / MGC Yard)
   iv. Location of Release
b. Recommendations (if any) for improved methods of capture (where multiple capture tools are used)
c. Where 20 or more native lizards are salvaged, confirmation of the requirement for monitoring surveys and commencement timing.

Reports on monitor surveys (if triggered): Reports shall include:

a. Monitor Survey number (monitoring surveys shall occur annually for five years following remediation/rehabilitation.
b. Map and description of remediation/rehabilitation
c. Survey methodology
d. Results of survey, including a summary of the previous year's results as appropriate, including:
   i. Species and demography (assessed as male/female/juvenile)
   ii. Recommendations (if any) and outcome of other recommended actions (if any).

The works completion report would be submitted to Wellington City Council within 20 working days.

6 CONTINGENCY ACTIONS

Contingency actions are necessary when lizard salvage or transfer efforts fail. For the Southern Seawall project, salvage applies to small parts of the footprint, and within a broader landscape where the Northern grass skink and Raukawa gecko are widespread and common.

All release sites are expected to support the same species assemblages, and individuals are not likely to be able to be distinguished. Therefore, success will be assessed by recolonisation of restored habitats (e.g. Moa Point remediation and triggered planting) or use of supplementary refuges at MGC.

Lizard mitigation often suffers from poor reporting and low success rates. This is frequently due to relocations involving small numbers of lizards into areas with existing populations, making outcome monitoring difficult. While this project may face similar challenges, its success criteria- focused on colonisation of enhanced habitats connected to existing ones- are considered more robust.

If triggered, monitoring does not detect lizards, salvage outcomes will be determined to be inconclusive. However, broader restoration is expected to yield long-term ecological benefits.

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Appendix A: Wildlife act approval[8]

This application seeks Wildlife Act approval to capture and relocate native lizards from the construction yards at Moa Point and MGC Yard. While potential adverse effects on native avifauna are predicted, such effects under the Wildlife Act would be avoided through timing of activities, preworks survey and implementation of an Avifauna Management Plan.

This section addresses the information required for an application for wildlife approval as set out in Schedule 7, clause 2(1) of the FTAA.

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

The purpose of the Project is to restore and enhance the Southern Seawall in order to improve the seawall defences of Wellington International Airport and protect the Airport from sea level rise. The purpose of the proposed activity, to capture and relocate native lizards from the Project area, is to enable the Project and ensure that the potential adverse effects on native avifauna are avoided / minimised.

Section 6.1 of this report identifies that a lizard management plan (LMP) should be prepared to minimise expected very low-level adverse effects on native lizards. The purpose of the LMP is to avoid injury and mortality to native lizards within low value rough grass patches within proposed construction yards at Miramar Golf Course and Moa Point. These effects would be minimised by way of capture and relocation of native lizards, accompanied with habitat enhancement and restoration of their habitats.

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

WIAL is applying for wildlife approvals to capture and relocate native lizards from the Project area, to suitable adjacent habitats in accordance with a Lizard Management Plan, supplied as part of the substantive application. Section 3 of the LMP identifies the methods to capture native lizards and relocate into assessed habitats described in section 4 of the LMP.

These activities will be carried out on land held by WIAL, WCC or the Crown but not on any public conservation land. A map identifying the locations in which the activity is to be carried out, including the Moa Point and MGC construction yards and the relocation habitats, is provided as Figure 4 of the LMP. The authorisation sought is to relocate native lizards.

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

The purpose of the Wildlife Act includes the protection of wildlife. The Wildlife Act protects animals classed as wildlife and controls how people interact with wildlife. The application is relevant to the Wildlife Act because it proposes vegetation removal activities that provide habitat to protected wildlife species, and these species may be killed or injured if unmanaged. These species are identified as native lizards and native birds (noting that potential direct effects on native birds would be avoided).

Section 6 of this report identifies actions that will be undertaken to avoid and minimise impacts on protected wildlife and these are further detailed in the LMP and AMP.

[8] Note: this section is coped from the Ecological Impact Assessment. It is provided here for ease of reference. Section numbers refer to the EcIA section and heading numbers.

Section 3.2 of the LMP specifically proposes capture and relocation of native lizards from habitats to protected and enhanced habitats to minimise mortality where they may occur within vegetation and habitats of the Project area.

We note that wildlife approval is requested in relation to native lizards only given appropriate measures will be implemented in relation to avoiding direct effects on native birds.

The numbers of wildlife potentially impacted and the nature of the potential impacts/effects (clause 2(1)(d), (e) and (j))

Section 4.3 of this report, specifically 4.3.3 for lizards, 4.3.4 for birds identifies the protected wildlife species known or predicted to be in the Project area and the numbers of wildlife present and potentially impacted, and these are summarised below.

Common name, species name, number:

Confirmed present:
Northern Grass skink, *Oligosoma ploychroma* < 200 individuals
Raukawa gecko, *Woodworthia maculata* < 80 individuals

Potential to be present (not recorded from survey):
Copper skink, *Oligosoma aeneum* < 10 individuals
Ornate skink, *Oligosoma ornatum* < 10 individuals
Glossy Brown skink, *Oligosoma zealandicum* < 10 individuals
Northern spotted skink, *Oligosoma kokowai* < 10 individuals
Minimac gecko, *Woodworthia Marlborough mini* < 10 individuals

Other species which may be present within the area but for which a Wildlife Act approval is not being applied for:
Banded dotterel, *Charadrius bicinctus* 1-3 breeding pairs

A range of native bird species as listed in Appendix C, of the Ecological impact Assessment.

Note that Little blue penguin *Eudyptula minor* are subject to a separate assessment .

Assessment of potential effects
Section 5 of this report addresses and outlines the impacts on threatened, data deficient, and at-risk wildlife species and the actual and potential wildlife effects of the proposed activity, specifically:

Moa Point **(Section 5.1, this report**):
5.1.2: Avifauna, and focus on banded dotterel
5.1.3: Herpetofauna (considers potentially present TAR lizards)

Miramar Golf Course **(Section 5.2, this report):**
5.2.2: Avifauna
5.2.3: Herpetofauna (considers potentially present TAR lizards)

Further consideration given to wildlife species (including TAR species) at section 5.3 (Indirect effects), particularly:
5.3.2: noise and vibration- particularly adjacent coastal birds
5.3.3: lighting- particularly seabirds

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

Section 6.1 of this report and the Lizard Management Plan describe these measures.

Best practice standards for managing New Zealand lizards are published in the Department of Conservation documents, 'Guidelines and model for producing management plans for New Zealand Lizards[9], and 'Key principles for lizard salvage and transfer in New Zealand'[10], the latter of which outlines nine principles for lizard salvage. These principles are addressed in **Table 3 of the LMP**.

Section 2.1 of the LMP sets appropriate timing for lizard capture (within September to April inclusive) as well as a robust two-week trapping period applying a multi-tool trap combination and minimum trap locations.

Traps cannot be left unchecked for more than 24 hours (**Section 3.2.3 of the LMP**) and all lizards would be transferred immediately to the release site (**Section 3.2.5**) following morphometric data collection to help describe the populations. Note that the LMP assumes an experienced herpetologist would manage these processes.

How adverse effects are avoided and minimised, and the offsetting/compensation proposed to address unmitigated adverse effects (clause 2(1)(k))

The sections of this report outlined in relation to clause (2)(1)(j) above conclude with a level of effect following description of matters that would further minimise adverse effects, or in some cases, result in positive levels (such as weed dominant vegetation being remediated with indigenous-dominant compositions).

No offset or compensation has been assessed as necessary as part of this application as there are no unmitigated adverse effects.

Other matters (clause 2(1)(l), (m), (n), (o))

The AEE addresses the other relevant matters for wildlife approvals, including confirmation that WIAL is not associated with any offence or criminal charge under the Wildlife Act, details of consultation with hapū and iwi, and all relevant expert advice received in relation to the Project.

[9] Department of Conservation Lizard Technical Advisory Group (2018). Guidelines and model for producing management plans for New Zealand lizards. Department of Conservation, Wellington. 26 p.
[10] Department of Conservation Lizard Technical Advisory Group (2019). Key principles for lizard salvage and transfer in New Zealand. Department of Conservation, Wellington. 23 p.

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