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Southern Seawall Renewal Project

Terrestrial and Freshwater Ecological Impact Assessment

for: Wellington International Airport Ltd.

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DOCUMENT CONTROL AND REVISION RECORD

Document title	Southern Seawall Renewal Terrestrial and Freshwater Ecological Impact Assessment
Prepared for	Wellington International Airport Ltd.

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Version	Date	Author(s)	Reviewer
1	1 January 2025	MS, CW	MA, CW
2	16 July 2025	MS, CW	MA, CW, TB
3	18 August	MS, CW	MA, CW
4	3 September 2025	MS, CW	MA, CW

Job number 67466	67466

Reference: Bioresearches (2025). Terrestrial and Freshwater Ecological Impact Assessment. Southern Seawall Renewal, Report for Wellington International Airport Ltd. pp 117.

Cover Illustration: Miramar Golf Course

EXECUTIVE SUMMARY

Background

Bioresearches (Babbage Consultants Limited) were engaged by Wellington International Airport Limited (WIAL, the Airport) to prepare an Ecological Impact Assessment (EcIA), for the Southern Seawall Renewal Project (the Project).

This EcIA covers the terrestrial and freshwater ecological values and impacts. Ecological values and effects on marine ecology (Bioresearches, 2025a) and kororā, *Eudyptula minor*, (Kororā Ornithology Ltd, 2025) are addressed in separate reports.

WIAL intends to seek resource consents, wildlife approvals, Reserves Act approvals and archaeological authorities for the Project under the Fast-track Approvals Act 2024 (FTAA). This assessment has been prepared to support an application under the FTAA for these approvals. In particular, it addresses the assessments and requirements for resource consents (as per the Resource Management Act 1991 (RMA)) and Wildlife approvals that would otherwise be sought under the Wildlife Act 1953 (Wildlife Act).

A specific section towards the end of this assessment addresses the Wildlife approvals. The Lizard Management Plan has been prepared to support both RMA and Wildlife approvals, while the Avifauna Management Plan will 'attach' to the RMA consents only. We also understand that this assessment may be relied on to support Reserves Act approvals that are also being sought through the overall FTAA application.

The Project will replace and extend the existing southern seawall to help safeguard the long-term operation of the Airport against natural hazards, increase the Airport's resilience to climate change, and reduce the increasing maintenance demands of the existing seawall.

The Project includes the following key elements:

- Establishing and using three laydown areas (Miramar Golf Course Yard (MGC Yard), George Bolt Street Yard, and Moa Point Yard) for storage and construction activities;
- Reconstructing the southern seawall with rock and Cubipods;
- Remediating the Eastern Bank with rock protection; and
- Creating two Kororā Colonies for habitat and breeding, one prior to works commencing and another on the completion of the works.

Refer to the Project Description (Mitchell Daysh, 2025) for a full description of the Project.

Assessment Approach

This assessment generally follows the EcIA Guidelines for use in New Zealand, published by the Environmental Institute of Australia and New Zealand (EIANZ) (Roper-Lindsay et al., 2018). The EcIA Guidelines provide a standardised matrix framework that allows analysis of ecological values and effects assessments to be clear, transparent, and consistent. Further to the guidelines, the key statutory framework is also applied to assessments, including the RMA, National Policy Statements (National Policy Statement for Indigenous Biodiversity (NPS-IB), National Policy Statement for Freshwater Management (NPS-FM)), National Environmental Standards for Freshwater (where applicable), the Regional Policy Statement and Natural Resources Plan for the Wellington Region, the Wellington City

District Plan, and the Wildlife Act. Site visits to the areas impacted were undertaken and the ecological values scored, the magnitude of impact scored and then these values were combined to ascertain an overall level of effect.

Key findings of this assessment include:

Moa Point (including the Moa Point Yard, seawall construction and Eastern Bank remediation and kororā colonies stage 1 and 2):

- The vegetation values on this site are considered low;
- The ecological values for fauna are low for coastal avifauna and invertebrates, moderate for lizards, and high for banded dotterel;
- The level of effect of the proposed Project on these values, with mitigation, are all no worse than low.

Miramar Golf Course Yard (MGC):

- The vegetation values on this site are considered negligible;
- The wetland ecological values are considered low;
- The fauna values (i.e., avifauna, lizards, bats, invertebrates) range from negligible to low; and
- The level of effect for the proposed Project (with mitigation) ranges from negligible to low.

Indirect Effects

- Noise and vibration: implementation of noise management during works, and exclusion areas for nesting avifauna within the Project Areas is recommended;
- Artificial light at night (ALAN): implementation of sensitive luminaries within the Project areas is recommended;
- Dust: Adherence to the Ministry for the Environment's 'Good Practice Guide for Assessing and Managing Dust' section 5.2 (Ministry for the Environment, 2016), is recommended; and
- Disturbance to nesting birds: establishment of yards prior to banded dotterel breeding is recommended, together with precautionary setbacks / exclusions zones for nesting birds.

The overall level of effect of the Project on flora and fauna values are assessed as no more than low, following application of mitigation recommendations (avoid, remedy, minimise) as discussed in Section 7. These actions are:

Avoid

- Avoid potential mortality or injury to nesting avifauna (e.g. mortality to eggs, chicks) through implementation of pre-construction surveying, establishment of construction yards pre-bird breeding, and as required, nest / chick protection and exclusion zones if necessary. The detailed methodology is set out in an avifauna management plan and key points described in Section 6.3;
- The Project design within the MGC Yard avoids *karo treeland and scrub* along the south-eastern boundary. As per the conditions of the Airport's existing designation, that habitat is instead designated as a landscape buffer zone, approximately 4.46 ha.

Minimise

- Vegetation loss is minimised at Moa Point by utilising the cleared embankment for the Moa Point Yard, and a cleared area of grassland on the corner of Stewart Duff Drive and Moa Point Road;
- Adverse effects to lizards will be minimised through various measures, with detailed methodology to be set out in the Lizard Management Plan (see Section 6.2) (Bioresearches, 2025b);
- Adverse effects to avifauna will be minimised through various measures, with detailed methodology to be set out in the Avifauna Management Plan (see Section 6.3) (Bioresearches, 2025c);
- Management of indirect lighting effects on coastal avifauna during construction through implementation of specified control measures (see section 5.1.3);
- Management of indirect noise effects on fauna by implementation of controls or practices which minimise noise (See section 5.1.2);
- Minimise dust effects by following the Ministry for the Environment's 'Good Practice Guide for Assessing and Managing Dust' section 5.1.4 (Ministry for the Environment, 2016);

Remediate

- Restoration planting and habitat enhancement of the Eastern bank, Reserve Restoration Area and Kororā Colonies (stage 1 and 2) at Moa Point, and the southern edge of the MGC Yard, shown in the various concept plans.

TABLE OF CONTENTS

List of Tables

List of Photos

List of Figures

[redacted]

List of Appendices

1 INTRODUCTION

Project Description

The Southern Seawall at Wellington International Airport (WIAL, the Airport) has reached the end of its functional life and requires reconstruction of its southern seawall defences. The proposed Southern Seawall Renewal Project (the Project) will help safeguard the long-term operation of the Airport against natural hazards, increase the Airport's resilience to climate change, and reduce the increasing maintenance demands of the existing seawall.

The Project (shown in Figure 1) includes the following key elements:

- Establishing the Miramar Golf Course and Moa Point construction yards (MGC Yard and Moa Point Yard, respectively) and using them, along with the existing George Bolt Street Construction Yard (George Bolt Yard), for storage and construction activities;
- Reconstructing the Southern Seawall with rock and Cubipods;
- Remediating the eroding Eastern Bank with rock protection - the rock protection on the Eastern Bank will provide a transition between the main Southern Seawall and the unprotected coastline further east; and
- Creating two new kororā colonies (stage 1 and stage 2).

Overall, the Project is expected to take six to eight years, with the seawall construction itself taking 24 to 30 months. Construction will be managed to maintain airport operations, minimise night-time noise, and work around adverse weather and sea conditions. The Project must also appropriately manage constraints arising from sourcing, transporting and stockpiling the significant volumes of rock and Cubipods required to complete the seawall works.

Purpose and Scope

WIAL intends to seek resource consents, wildlife approvals, Reserves Act approvals and archaeological authorities for the Project under the Fast-track Approvals Act 2024 (FTAA). This assessment has been prepared to support an application under the FTAA for these approvals (as relevant). In particular, it addresses the assessments and requirements for resource consents (as per the RMA) and approvals under the Wildlife Act 1953 (Wildlife Act). A specific section towards the end of this assessment addresses the Wildlife Act. A Lizard Management Plan has been prepared to support both RMA and Wildlife Act consents / authorisations, while an Avifauna Management Plan will 'attach' to the RMA consents only.

We also understand that this assessment may be relied on to support Reserves Act approvals that are also being sought through the overall FTAA application.

With that context in mind, the purpose of this report is to undertake an assessment of the terrestrial and freshwater ecological values within the Project footprint, and an associated assessment of the expected and potential effects of the proposed operation of the Project (both during construction and operational phases) on those values. The marine ecological values and the Project's effects on them are addressed in a separate EcIA; *Southern Seawall Renewal Project: Marine Ecological Impact Assessment*

(Bioresearches, 2025a). That report includes minor areas of ecological overlap within the coastal environment, not otherwise addressed within this EcIA.

The authors of this report are Michaela Scarrott and Chris Wedding, with review by Dr Michael Anderson and Treffery Barnett. We have the qualifications and expertise set out in Appendix E and confirm that we have read the Code of Conduct for expert witnesses contained in the Environment Court Practice Note 2023. This report has been prepared in compliance with that code, as if it was expert evidence presented in proceedings before the Environment Court. Unless we state otherwise, this report is within our area of expertise and we have not omitted to consider material facts known to us that might alter or detract from the opinions expressed in this report.

1.1 Site overview

The Project areas (described in Section 1.2) are generally all highly modified environments, including:

1. MGC Yard: land that was formerly part of a managed golf course;
2. Moa Point: a largely constructed area that comprises the Seawall itself and an adjacent reclaimed area of predominantly dumped hardfill material; and
3. George Bolt yard: a concreted site that will be used during the Project to store construction material, plant and equipment, and associated activities.

The proposed MGC Yard is zoned as 'special purpose airport zone' whilst Moa Point is zoned as 'natural open space zone' under the Proposed Wellington City 2024 District Plan.[1]

Potential habitats in the Project areas comprise naturally occurring and amenity plantings of indigenous and exotic vegetation, one natural inland wetland, and coastal bird roosting and nesting habitat, predominantly associated with built structures.

1.2 Works areas

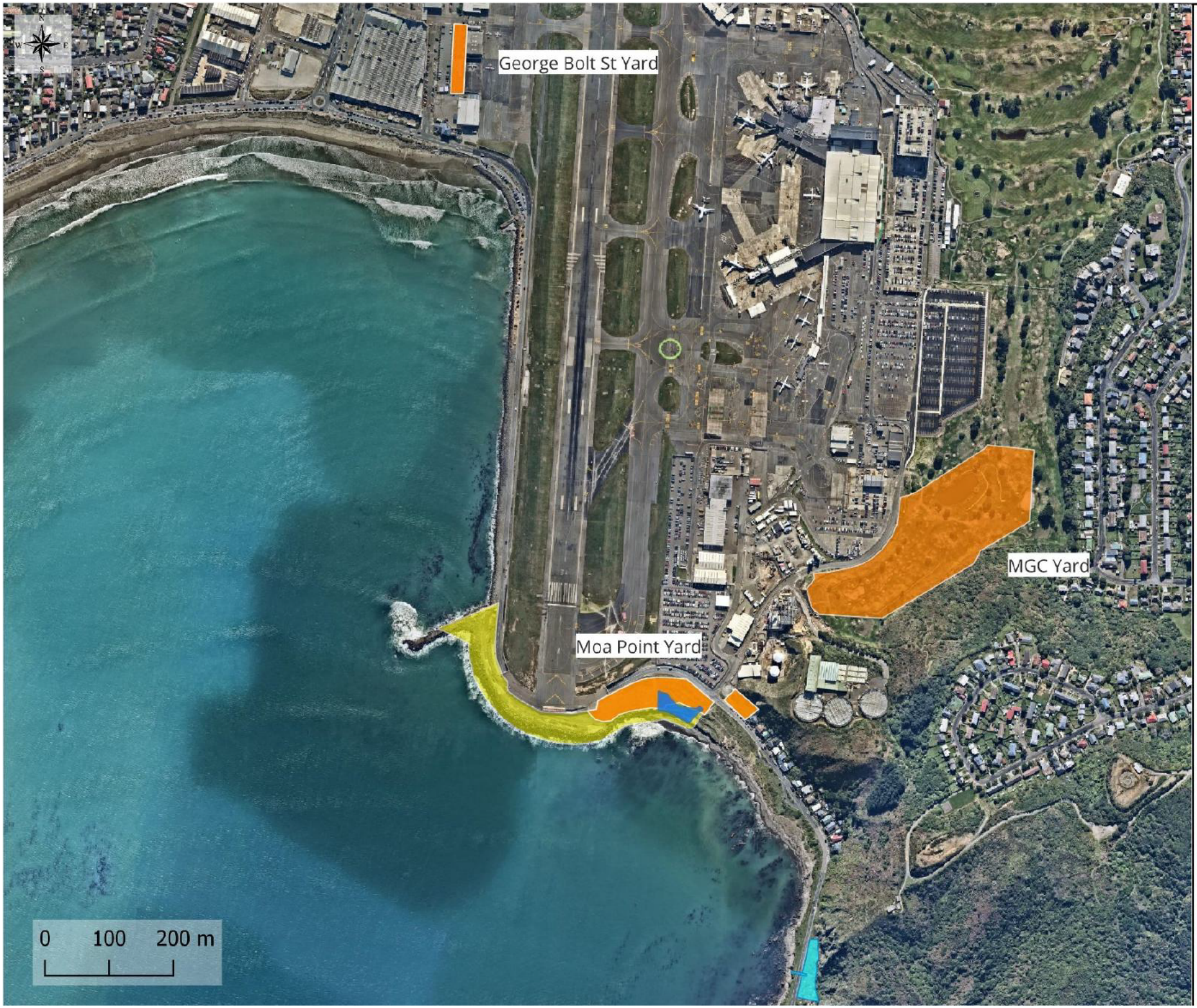
Areas of works identified as relevant to the project include; the southern seawall construction, eastern bank remediation, kororā colonies (stage one and two) and three construction yard areas (MGC, Moa Point and George Bolt Yards). As the George Bolt yard already exists and is currently utilised for similar proposed activities (i.e. storage of materials), it is not included within the scope of this EcIA.

The relevant areas assessed within this EcIA are shown in Figure 1, being the MGC Yard and Moa Point (which includes the Moa Point Yard, southern seawall construction, eastern bank remediation, and kororā colonies) are referred to as 'the Project areas'.

Works within the Project areas, including vegetation removal requirements, are described in detail below in section 1.2.1 and section 1.2.2. In addition to the construction works, the Project will also include operational activities and vehicle movements between Project areas over the Project's duration further described in the Assessment of Environmental Effects (Mitchell Daysh, 2025).

[1] Wellington City 2024 District Plan appeals version, https://eplan.wellington.govt.nz/proposed/property/17190-99001/0/60?_t=property

Figure 1. (over page) Overview of the proposed project, showing the proposed works site for seawall renewal at Moa Point including stage 1 kororā colony, and three proposed laydown yards. (based on Beca 07-07-2025; Project Wide Maps)



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CLIENT / PROJECT

Wellington International Airport Ltd.

Site Overview

Legend

- Construction Yards
- Moa Point Works Area
- Korora Colony - Stage 1
- Korora Colony - Stage 2

SOURCES
LINZ

MAP PROJECTION
NZGD2000 / New Zealand Transverse Mercator 2000

DISCLAIMER:
This map/plan is not an engineering draft. This map/plan is illustrative only and all information should be independently verified on site before taking any action.

MAP NO.

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1.2.1 Moa Point

Moa Point is located along the southern coastal margin of Wellington International Airport (Figure 2) and is the site for the proposed southern seawall construction, Moa Point Yard, Eastern Bank remediation and the creation of two kororā colonies (developed in stages; stage 1 and stage 2). The site is approximately 3 ha in total and will include the following works as per the project description (Mitchell Daysh, 2025) and described below.

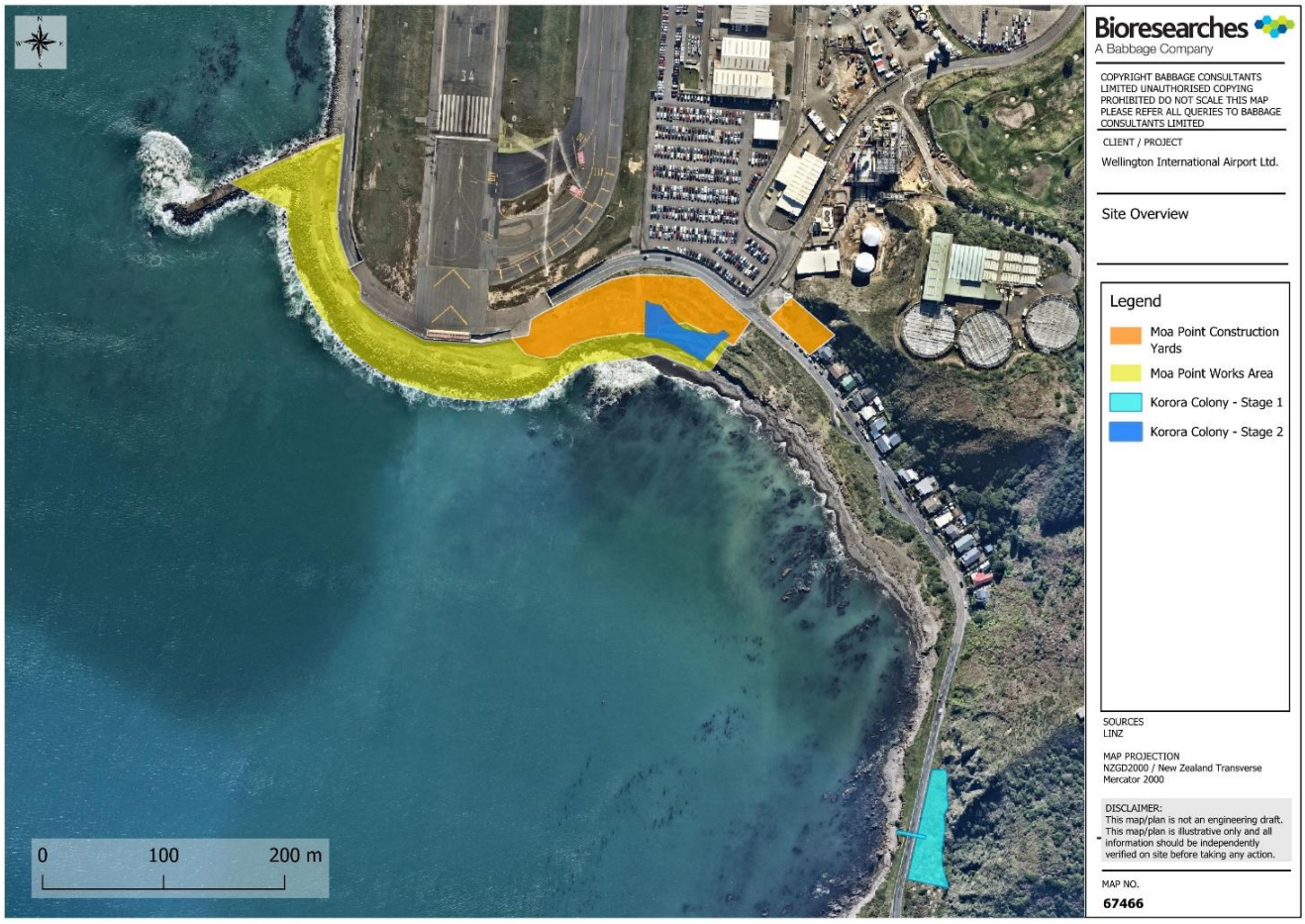

Figure 2. Works areas at Moa Point (based on Beca 07-07-2025; Project Wide Maps)

1.2.1.1 Southern Seawall Construction:

- Prior to seawall construction commencing, the site will need to be cleared, and ground improvements, such as cement-stabilized hardstanding or micropiling and /or piling, may be required to support construction equipment; and
- Once the site is established, the construction process includes: removing existing reno mattresses, gabion baskets, Akmons and rock from the seawall crest area; excavating the seawall toe trench; smoothing rock pinnacles and / or placing toe rock; and placing underlayer rock and reused Akmons. Cubipods will be installed over the underlayer. Additional tasks include placing a gabion and crest wall if required, constructing rock protection on the crest, and replacing rear slope geotextile, underlayer and rock armour.

1.2.1.2 Moa Point Yard Site Establishment:

- Installation of security fencing with specific controlled site entries and exits;
- Implementation of erosion and sediment control measures;
- Installation of portable 'Satellite' buildings for offices, amenities and maintenance purposes, including connections to services such as power and water (by intersection of Moa Point Road and Stewart Duff Drive);
- Location and protection of existing services, with services relocated if required;
- Stripping and stockpiling topsoil (where it is present), and large plant relocation (e.g., harakeke) if required;
- Earthworks to recontour the site to a level surface, suitable for yard activities, and clay capping if required;
- Installation of drainage;
- Construction of all-weather (granular, permeable) pavements;
- Levelling of area and contouring edge of wave trap for construction access;
- Installation of reinforced concrete vehicle entrances at site entrance and exit; and
- All associated and ancillary activities.

Upon Project completion, the Moa Point yard is proposed to be rehabilitated (see Figure 4).

1.2.1.3 Stage 1 Kororā Colony

The first stage of the kororā colony will be constructed ~400 m southwest of the Moa Point Yard, in advance of the main seawall construction to allow for the relocation of kororā before habitat within the construction footprint is lost, and in accordance with a kororā management plan (Kororā Ornithology Ltd, 2025).

Works here will include:

- A concrete culvert underpass from the Moa Point beach to the colony on the landward side under Moa Point Road. An underpass headwall on the landward side;
- A 1.5m high waratah and deer mesh style fencing around the colony to protect kororā from dogs and people, with a 1.5m-2m wide pedestrian fence in gate on the south eastern landward side;
- Placement of ~100 kororā nest boxes;
- Up to 300mm wide crusher dust paths, leading from the underpass to nest boxes to improve kororā access within the colony;
- Rocks sourced from the local area to be placed along the shoreline at the bottom of the bank to reduce erosion, and large rocks (1-2m+) to the north and south of the culvert on Moa Point Beach to limit pedestrian access;
- Rocks within the underpass, and above the underpass to enhance the kororā passage entrance;
- Replacement of weed species with appropriate native planting;
- Screen planting of *Phormium tenax* along the landward and seaward fence-lines on Moa Point Road;
- Installation of road-side bollards and a low timber post and rail fence along the embankment on the western aspect of Moa Point Road.

An indicative plan showing how the kororā colony will look has been prepared by Boffa Miskell, is referred to in the specific kororā technical assessment prepared by Dr John Cockrem, and is included as Figure 3 below.

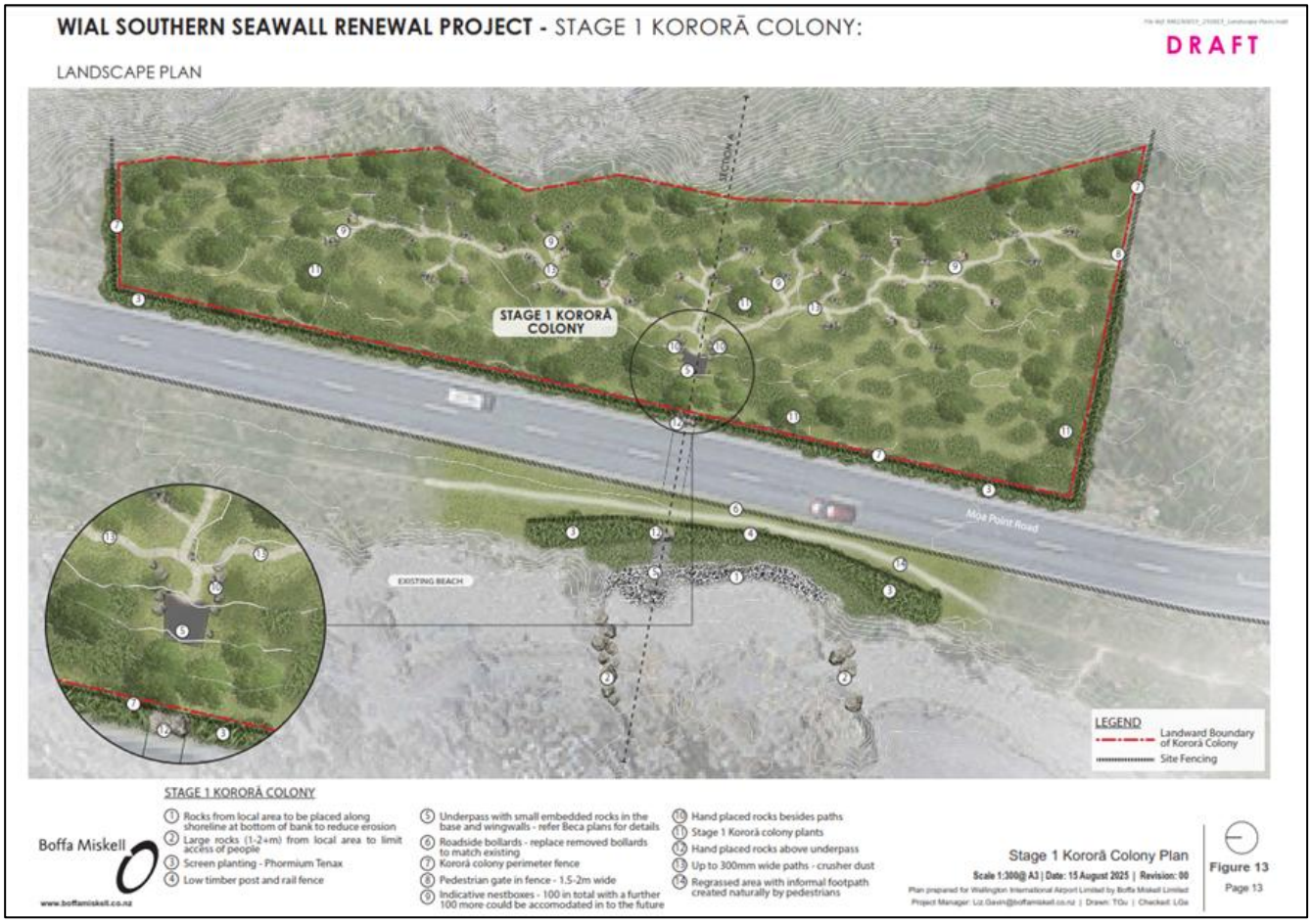

Figure 3. Indicative landscape plan for the Stage 1 Korora Colony provided by Boffa Miskell – 15-08-2025

1.2.1.4 Remediation of the Eastern Bank and Reserve Restoration area

Following demobilisation of the Moa Point Yard, the Eastern Bank and Reserve Restoration Area (Figure 4) will be reinforced with rock and/or plantings to reduce the active erosion of the existing bank, reinstate the coastal environment, and provide additional habitat for kororā which are known to inhabit the seawall and surrounding coastline, and other fauna such as lizards. The Moa Point Yard will also be reinstated to a level, open area to provide nesting opportunities for banded dotterel. This remediation will be done in accordance with the Moa Point Yard Rehabilitation Concept Plan (Boffa Miskell, 2025a). Works here will include:

- Creation of undulating mounds to recreate natural contoured landform;
- Appropriate coastal native planting and landscaping;
- Creation of a compacted gravel path loop, to connect the existing reserve pathway;
- Fencing around the reinstated yard and rehabilitation area;
- Protecting existing services and reconstruction of the existing stormwater outlet;
- Contouring the existing bank, with any cut material to be placed on the Moa Point Yard and the kororā habitat;
- Clearance and storage of granular beach material, excavation of toe key in rock and placement of excavated rock on Moa Point Yard and the kororā habitat;
- Placement of geotextile along the eastern remediation bank;
- Construction of rock protection from the toe landward, and working progressively along the structure;
- Replacement of beach material over the lower rock protection; and
- All associated and ancillary activities.

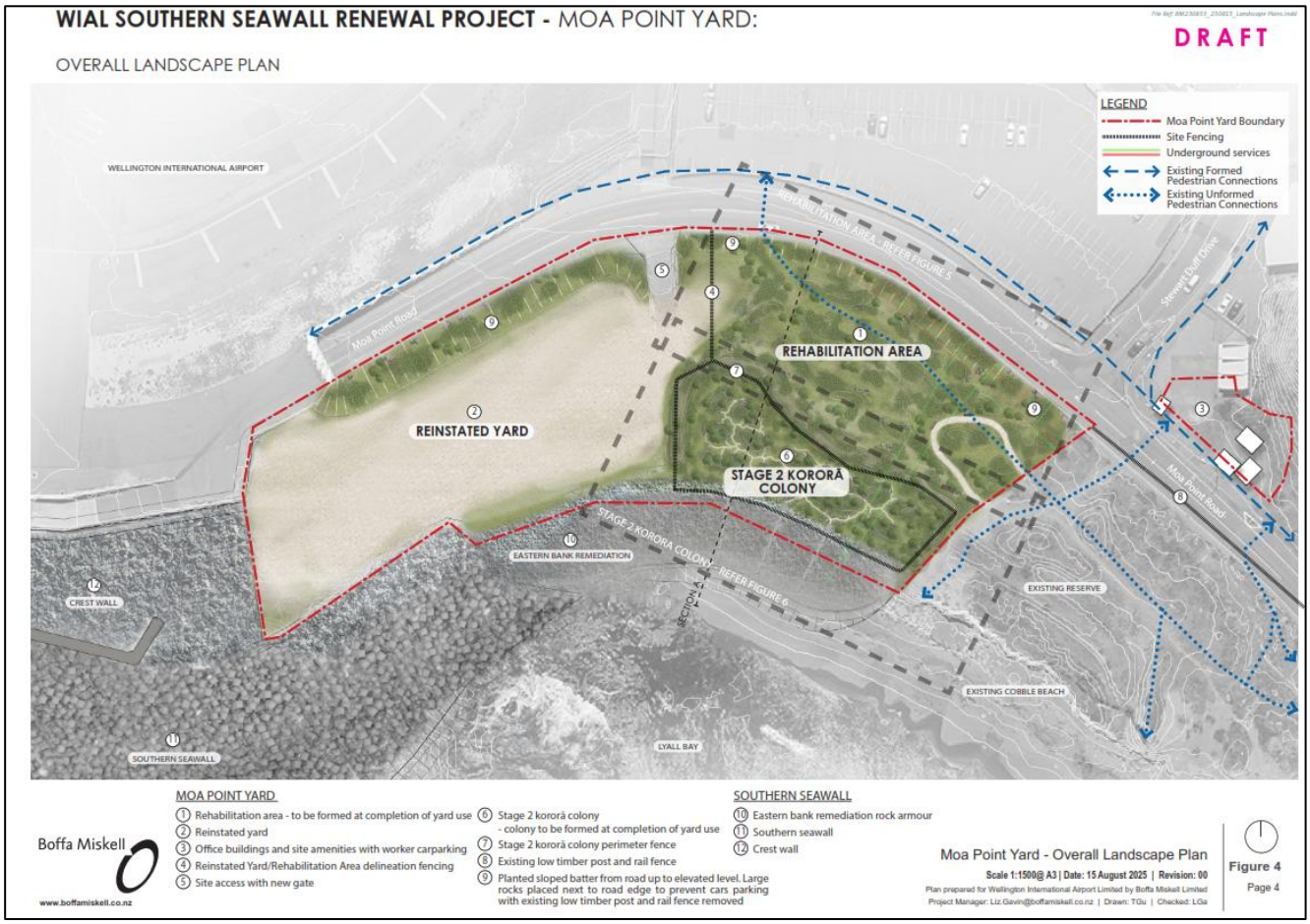

Figure 4. Construction Yards, Eastern Bank Remediation, Reserve Restoration area and Stage 2 Korora Colony at Moa Point, Provided by Boffa Miskell, 15-08-2025

1.2.1.5 Kororā Colony Stage 2

Establishment of the second stage of the kororā habitat (shown in Figure 5, which is an indicative landscape plan that has been prepared by Boffa Miskell) will be undertaken following completion of the Project (following site demobilisation) and on completion of the Southern Seawall, as part of the Eastern Bank Remediation, and following a kororā management plan (Kororā Ornithology Ltd, 2025). Works to support the establishment of the Stage 2 kororā colony will include:

- Minor earthworks to improve kororā access, shelter and nesting opportunities;
- Contouring of the area to create earth mounds (1-2m high, 4-5m wide), to provide shelter for kororā and recreate the previous landform contours;
- A 1.5m high waratah and deer mesh style fencing around the colony to protect kororā from dogs and people, with a 1.5m-2m wide pedestrian fence in gate on the east and west sides of the fence;
- Placement of ~60 kororā nest boxes;
- Up to 300mm wide crusher dust paths, leading from the eastern bank to nest boxes to improve kororā access within the colony;
- Concrete channels through the revetment wall to increase accessibility for kororā through the eastern bank;
- Hand placed rocks along the gravel paths;
- Appropriate coastal native planting and landscaping; and
- All associated and ancillary activities.

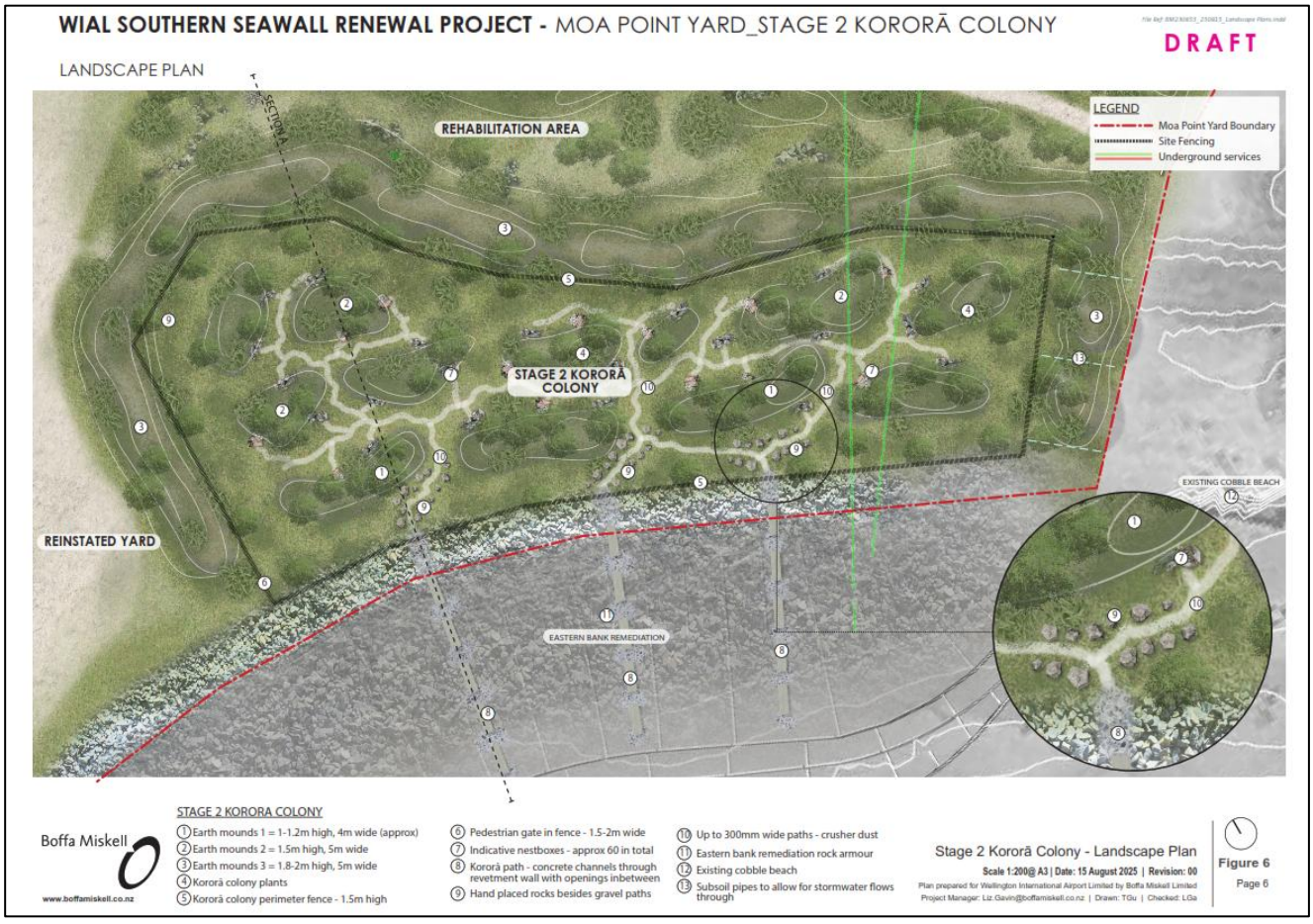

Figure 5. Stage 2 Korora Colony indicative landscape plan, provided by Boffa Miskell, 15-08-2025

1.2.2 Miramar Golf Course (MGC) Yard

Miramar Golf Course is located directly east of Wellington International Airport and will be the site for the MGC Yard (~4.3 ha within the south area that was formerly part of the Miramar Golf Course) (Figure 6). The MGC Yard will be the primary storage and maintenance yard for the Project. The MGC Yard will be used for

stockpiling rock and Cubipods and other materials, plant and equipment storage, and material storage. It will also include a site office and staff welfare facilities. Site establishment will begin as soon as consents are granted and will require extensive earthworks and associated activities to level the site to an appropriate grade and provide services, drainage, erosion and sediment control, and to form unbound access roads and construct concrete entry / exit crossings. Mitigation plantings will be undertaken along the eastern and southern perimeter of the MGC Yard following a site-specific planting plan (including grasses, small shrubs and small trees), in accordance with the MGC Yard Concept Plan (Boffa Miskell, 2025a).

The MGC Yard establishment works are expected to commence in 2026 and will take up to 7 years to complete progressively as storage area is required. Once the Project is complete, the site will be demobilised and disestablished, involving removal of all construction facilities, including yard buildings, on site.

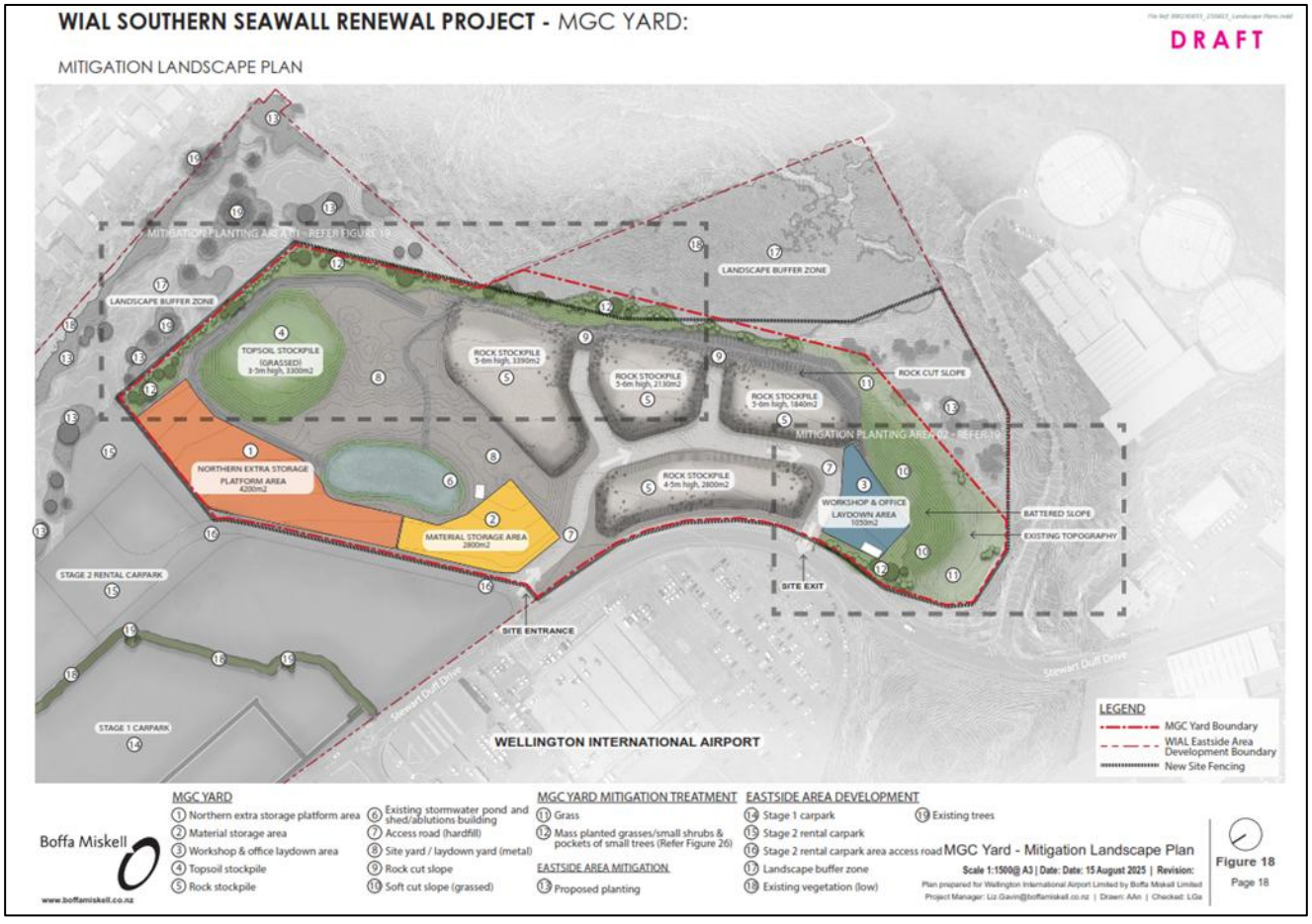

Figure 6. MGC Site and Mitigation Landscape Plan for the Miramar Golf Course, provided by Boffa Miskell, 15-08-2025

1.2.3 Operational Timings

The Project is estimated to take between six to eight years to complete, though this may be extended for areas needed to support stage two of the project (i.e. the Western Seawall renewal works).

Construction at the southern seawall site at Moa Point is anticipated to operate up to 24 hours a day, 7 days a week. Due to airport operational constraints, the majority of construction work on the seawall and at Moa Point Yard will occur at night. Moa Point Yard is expected to operate for seven years to support the project, though this may extend to support the subsequent stages of the project (i.e. the Western Seawall renewal works). The seawall construction is estimated to take 24-30 months.

The MGC Yard will operate fully from 7:30 am to 6:00 pm, Monday to Sunday. On weekdays between 6:30 am and 7:30 am and 6:00 pm and 8:00 pm, heavy vehicle access will be restricted to Stockpile 4 only, with the remainder of the yard closed to heavy vehicles during these times. Outside of these hours, access to the yard will be limited to light vehicles only.

The plant and equipment required for works on the kororā colonies, and the Eastern Bank Remediation will be able to operate under WIAL's obstacle limitation surfaces, therefore, construction in this area will occur within daylight hours. It will take approximately three months to construct each stage of the kororā colonies and the Eastern Bank Remediation.

1.3 Zone of Influence

The zone of influence (ZOI) of the Project relates to an area occupied by habitats and species that are adjacent to and may extend beyond the physical footprint of the Project as well. It is defined in the EIANZ Guidelines (Roper-Lindsay et al, 2018) as "*the areas/resources that may be affected by the biophysical changes caused by the proposed Project and associated activities*". Indirect effects (such as noise, light and vibration) and direct effects generated during the Project can impact species within the site and outside of the site boundary. Areas outside the Project site that may be affected by the Project are considered to be within the ZOI.

2 STATUTORY CONTEXT

We have considered the following statutory framework to guide this assessment:

- Fast-track Approvals Act 2024 (FTAA)
- Resource Management Act (RMA, 1991);
- RMA policy and planning instruments including:
    - New Zealand Coastal Policy Statement (NZCPS);
    - National Policy Statement for Indigenous Biodiversity (NPS-IB);
    - National Policy Statement for Freshwater Management (NPS-FM);
    - National Environmental Standards for Freshwater (NES-F);
    - Regional Policy Statement for the Wellington Region (RPS), including PC1 to the RPS;
    - Wellington Natural Resources Plan (NRP), including PC1 to the NRP;
    - The operative Wellington District Plan and Proposed Wellington District Plan;
- Wildlife Act (WA,1953).

2.1 Fast-track Approvals Act 2024

The purpose of the FTAA is to facilitate the delivery of infrastructure and development projects with significant regional or national benefits. The system is intended to be a 'one-stop-shop' for (as relevant to ecological matters) resource consents under the Resource Management Act 1991, wildlife permits under the Wildlife Act 1953 and approvals under the Reserves Act 1977.

2.2 Resource Management Act 1991

The purpose of the RMA is to promote the sustainable management of natural and physcial resources.[2] Sustainable management under the RMA requires avoiding, remedying, or mitigating any adverse effects of activities on the environment. To achieve the purpose of the RMA, matters of national importance are to be recognised and provided for, including the protection of significant indigenous vegetation and habitats.[3]

2.3 National Policy Statements

2.3.1 New Zealand Coastal Policy Statement 2010 (NZCPS)

Policy 11 of the NZCPS provides for the protection of biodiversity as follows:

To protect indigenous biological diversity in the coastal environment:

(a) avoid adverse effects of activities on:

[2] RMA, section 5.

[3] RMA, section 6(c).

(i) indigenous taxa that are listed as threatened or at risk in the New Zealand Threat Classification System lists;
(ii) taxa that are listed by the International Union for Conservation of Nature and Natural Resources as threatened;
(iii) indigenous ecosystems and vegetation types that are threatened in the coastal environment, or are naturally rare;
(iv) habitats of indigenous species where the species are at the limit of their natural range, or are naturally rare;
(v) areas containing nationally significant examples of indigenous community types; and
(vi) areas set aside for full or partial protection of indigenous biological diversity under other legislation;

(b) avoid significant adverse effects and avoid, remedy or mitigate other adverse effects of activities on:
(i) areas of predominantly indigenous vegetation in the coastal environment
(ii) habitats in the coastal environment that are important during the vulnerable life stages of indigenous species
(iii) indigenous ecosystems and habitats that are only found in the coastal environment and are particularly vulnerable to modification, including estuaries, lagoons, coastal wetlands, dunelands, intertidal zones, rocky reef systems, eelgrass and saltmarsh.
(iv) habitats of indigenous species in the coastal environment that are important for recreational, commercial, traditional or cultural purposes
(v) habitats, including areas and routes, important to migratory species
(vi) ecological corridors, and areas important for linking or maintaining biological values identified under this policy.

In respect of terrestrial ecology, Policy 11 is most relevant to the threatened / at risk avifauna species that use or may use the Project area. As discussed in this report, effects on those species will be carefully managed, so that they will essentially be avoided.

2.3.2 National Policy Statement for Indigenous Biodiversity (NPS-IB, 2023)

The objective of the NPS-IB (2023) is to maintain indigenous biodiversity in the terrestrial environment, requiring at least no overall loss in indigenous biodiversity nationally. It is relevant to the project because the site is partly within the terrestrial environment, and it contains indigenous biodiversity as defined in Section 1.6 of the NPS-IB.

The NPS-IB requires that indigenous biodiversity outside Significant Natural Areas (SNAs) is managed as follows:[4]

A. Significant adverse effects of any new subdivision, use, or development must be managed by applying the effects management hierarchy (avoid, minimise, remedy, offset, compensate).
B. Adverse effects of any new subdivision, use, or development that are not significant must be managed to give effect to the objective and policies of the NPS-IB.

[4] NPS-IB, clause 3.16(1) and (2).

The NPS-IB requires that adverse effects on indigenous biodiversity within an SNA be avoided,[5] except as provided for in clause 3.11. Clause 3.11 applies to the "construction or upgrade [. . .] of specified infrastructure that provides significant national or regional public benefit", and provides that the adverse effects of those developments be managed in accordance with the effects management hierarchy.[6] "Specified infrastructure" is defined as including "infrastructure that delivers a service operated by a lifeline utility"[7], which includes Wellington International Airport.[8]

2.3.2.1 Tangata Whenua

The NPS-IB recognises tangata whenua as kaitiaki of, and partners, in the management of indigenous biodiversity.[9] At the time of preparation of this report, Taranaki Whānui (represented by the Port Nicholson Block Settlement Trust) and Ngāti Toa (represented by Te Runanga o Toa Rangatira Inc).

2.3.3 National Policy Statement for Freshwater Management (NPS-FM, 2020)

The NPS-FM provides direction under the RMA, to local authorities on managing activities that affect the health of freshwater, and provides protections to freshwater bodies, including natural inland wetlands, and includes provisions for monitoring and reporting on freshwater quality and quantity, and for addressing the impacts of land use activities on freshwater resources.

The NPS-FM is relevant to the project because the MGC Yard is within proximity of an area that has been delineated as a 'natural inland wetland'.[10] There are no streams or other natural inland wetlands which are affected by the Project.

In relation to natural inland wetlands, the NPS-FM requires that:[11]

> *The loss of extent of natural inland wetlands is avoided, their values are protected, and their restoration is promoted, except where:*
>
> *(a) the loss of extent or values arises from any of the following:*
>
> *(. . .)*
>
> *(vi) the maintenance or operation of specified infrastructure, or other infrastructure (as defined in the Resource Management (National Environmental Standards for Freshwater) Regulations 2020; and*
>
> *(. . .)*
>
> *(b) the regional council is satisfied that:*
>
> *(i) the activity is necessary for the purpose of the construction or upgrade of specified infrastructure; and*
>
> *(ii) the specified infrastructure will provide significant national or regional benefits; and*
>
> *(iii) there is a functional need for the specified infrastructure in that location; and*
>
> *(iv) the effects of the activity are managed through applying the effects management hierarchy.*
>
> *(. . .)*

[5] NPS-IB, clause 3.10(2).
[6] NPS-IB, clauses 3.11(1) and 3.10(3) and (4).
[7] NPS-IB, clause 1.6 and as defined in section 4 of the Civil Defence Emergency Management Act 2002.
[8] See section 4 and Schedule1, Part A of the Civil Defence Emergency Management Act 2002.
[9] NPS-IB, clause 3.3.
[10] This is defined in clause 3.21(1) of the NPS-FM.
[11] NPS-FM, clause 3.22.

The NPS-FM adopts the same definition of 'specified infrastructure' as the NPS-IB, and this includes the Airport.[12]

2.3.4 National Environmental Standard for Freshwater (NES-F, 2020)

The National Environmental Standards for Freshwater 2020 (NES-F) set requirements for carrying out certain activities that pose risks to freshwater and freshwater ecosystems. As with the NPS-FM, the NES-F is relevant to this project because the site contains a small natural inland wetland within 100 m of the works area. Under the NES-F, works proposed within 100 m of a natural inland wetland are required to be assessed to ensure that potential impacts to the wetlands are managed.

Regulation 45 (3) of the NES-F states:

> *Earthworks or land disturbance outside a 10 m, but within a 100 m, setback from a natural inland wetland is a discretionary activity if it—*
>
> *(a) is for the purpose of constructing specified infrastructure; and*
>
> (b) *results, or is likely to result, in the complete or partial drainage of all or part of the natural inland wetland.*

The NES-F adopts the same definition of 'specified infrastructure' as the NPS-FM and the NPS-IB, and this includes the Airport.[13]

The application of the NPS-FM and NES-F in respect of the small natural inland wetland near the MGC Yard is discussed later in this report.

2.3.5 Wellington Regional Policy Statement and Natural Resources Plan

The Regional Policy Statement for the Wellington Region spatially identifies zones within the district plan as areas with environmental commonalities for effective management, whilst overlays spatially identify values or risks within the landscape that require separate management such as significant natural areas, outstanding natural landscapes and mineral resources.

The Natural Resources Plan for the Wellington region (**NRP**) sets out the relevant planning provisions (objectives, policies and rules) that apply to the use of resources in the region. A number of these provisions relate to the management of effects of use and development on biodiversity. Specifically, there are policies (P38) that implement Policy 11 of the NZCPS at a regional level, and require avoidance of adverse effects on indigenous biodiversity, or to otherwise manage effects through the effects management hierarchy. We have noted the application of Policy 11 of the NZCPS (and therefore the NRP provisions that implement it) above.

2.3.6 Wellington District Plan

The Wellington District Plan sets out the relevant planning provisions (objectives, policies and rules) that promote the sustainable management of natural and physical resources in Wellington, and that are relevant to the outcomes that the Wellington City Council seeks to achieve. Wellington City Council is currently reviewing its District Plan. There are general provisions in both the operative and proposed

[12] NPS-FM, clause 3.21 and NPS-IB, clause 1.6.

[13] NES-F, regulation 3, NPS-FM, clause 3.21 and NPS-IB, clause 1.6.

District Plan that relate to the effects of use and development on ecological values which are addressed in this EcIA, and there are no issues in regard to these from an ecology perspective.

We note that the proposed District Plan includes policies in respect of Significant Natural Areas (SNAs). SNAs are addressed later in this report.

2.4 Wildlife Act 1953

The Wildlife Act 1953 provides for the protection of listed species classed as 'wildlife'. It controls how people interact with Wildlife and provides legal protection to listed species including all native birds (except two), bats, frogs, lizards, and some invertebrates. The Act does not apply to plants or freshwater fish.

Under the Fast Track Approvals Act 2024, a wildlife approval is sought to capture and relocate native lizards under section 42(4)(h). That is discussed at Section 7 of this report.

3 METHODS

This EcIA generally follows Ecological Impact Assessment Guidelines (EcIAG) for use in New Zealand, published by EIANZ (Roper-Lindsay et al., 2018), described in further detail in Appendix B.

3.1 Desktop Analysis

A desktop review of various online GIS databases was undertaken to determine the extent of ecological overlays, 'ecosystem type' classifications, and visualise historical land-use from historical aerial images. The desktop review also included a search for fauna records from various information sources. Specifically, the following databases and reports were reviewed:

- Department of Conservation Bioweb records for herpetofauna and bats;
- iNaturalist records for herpetofauna within approximately a 5 km radius from the Project areas, invertebrates within 2 km, and birds within approximately a 15 km radius. A 15 km radius was chosen to account for the effects of artificial light at night (ALAN) which has been shown to effect seabirds up to 15 km away (Rodríguez et al, 2014);
- New Zealand Bird Atlas (eBird) records for birds within adjacent 10 x 10 km grid squares encompassing a 15 km radius from the site (grids BZ67, BY67, CA67 and BZ66);
- Department of Conservation Threat Classification Series;
- New Zealand Land Cover Database (LCDB v5.0);
- Retrolens historic aerial imagery;
- Avifauna data sets for banded dotterel (pohowera; *Charadrius bicinctus*) at Wellington International Airport; and
- Previous ecological assessments within and around the Project area (and refer Table 1 and the text below):
    - NIWA (2021). Wellington International Airport Coastal Bird Survey
    - Bioresearches (2022). Miramar Golf Course – Ecological Constraints Assessment
    - Pattle Delamore Partners Ltd. (2023). Ecological Impact Assessment- Miramar Golf Club
    - RMA Ecology (November 2023). Wellington International Airport: Lyall Bay and Moa Point proposed SNA review
    - Bluegreen Ecology (2024). Coastal avifauna survey results

Previous ecological assessments undertaken between 2022 – 2024 have also been utilised for this EcIA where relevant, as detailed in Table 1. These include two ecological impact assessments undertaken at Miramar Golf Course (PDP, 2023; Bioresearches, 2022), a Proposed SNA Review at Lyall Bay and Moa Point (RMA Ecology, 2023), and Proposed SNA Review at Moa Point (Bioresearches, 2024).

Table 1. Previous ecological assessments utilised within this EcIA

Location	Taxa and/or ecosystem assessed	Assessment / Survey	Report reference
Moa Point	Vegetation, Lizards, Avifauna, Coastal Ecology	SNA Assessment	RMA Ecology (2023)
	Vegetation, Lizards, Avifauna, Coastal Ecology	SNA Assessment	Summary of Evidence
Miramar Golf Course	Inland Freshwater constraints, lizards, avifauna	Values assessment only	Bioresearches (2022)
	Lizards, Avifauna, Wetland	Ecological Impact Assessment	PDP (2023)

3.2 Site Assessments

The Project areas were visited on several occasions to view the existing environments and potential habitat values, and undertake surveys for freshwater constraints, coastal avifauna (by experienced ornithologists) during the main breeding season, and to undertake a lizard survey of potential lizard habitat within the project area as well as adjacent, contiguous areas. These site visits were on 23 May 2022; 26 July and 11 & 12 October 2024; 2 & 8 April 2025 and 10 July 2025.

3.2.1 Freshwater Constraints

Site visits were undertaken by an experienced freshwater ecologist. The Miramar Golf course was walked over and all freshwater habitats were classified in accordance with Greater Wellington Regional Council's guidance note '*How to determine whether a watercourse is a river, ephemeral watercourse, highly modified river or stream, or artificial watercourse'* (GWRC, 2021).

All wetlands or potential wetland areas were classified in accordance with the Ministry for the Environment Wetland Delineation Protocols (MfE, 2022) to ascertain if the area presented with the physical characteristics to be considered a Natural Inland Wetland.
All wetland assessments were carried out within the Wellington region's 'growing season' (MfE, 2021b).

3.2.2 Coastal birds

Two ornithologists (Appendix E) visited Moa Point on 11th October 2024 during calm, settled weather to undertake coastal bird surveys at Moa Point. The purpose of these surveys was to determine the number and species of breeding pairs within and around Moa Point. This survey was aligned with high tide to record coastal bird species utilising the site for roosting as well as breeding. An initial point count was undertaken approximately 2 hours prior to high tide to identify all coastal avifauna present, with additional observations made over the course of 1.5 hours while moving through different vantage points at the site. This strategy was implemented rather than five or 15-minute point counts to maximise the likelihood of capturing lower-incidence and cryptic species/ behaviours.

Two ornithologists also visited the site on 10th July 2025, to assess coastal bird presence on site at the beginning of the breeding season, and to undertake additional surveys due to updated Project designs.

All observed breeding pairs were identified and mapped.

3.2.3 Lizard survey

The Moa Point and MGC Yards were visited on 2 April 2025 to install tracking tunnels, fitted with ink cards and baited with a small piece of banana to attract native lizards. Ink cards are a common method used to passively detect small wildlife, particularly rodents, but also lizards, by capturing their footprints.

A total of 25 baited tracking tunnels with ink cards were installed through potential habitats at each of the MGC and Moa Point Yards (50 tunnels in total, Figure 25, Figure 26). The equipment was left in situ for six days and collected for footprint analysis and opportunistic habitat searches. During equipment installation and retrieval, visual observations of fauna were also recorded.

4 EXISTING ENVIRONMENT AND VALUES

4.1 Moa Point

Until the early 1950s when construction of Wellington International Airport caused extensive reclamation of the peninsula, most of this site was below the mean high-water springs, with only a rocky coastline and narrow gravel beach at the south-eastern end. Construction of Wellington International Airport was substantially completed in the 1970s, forming what is now present-day Moa Point (Figure 7).

Figure 7. Moa Point Historic Images; 1938, 1988, and 2021, showing extensive reclamation of the coastal landscape.

4.1.1 Habitats at Moa Point

The proposed works area at Moa Point is approximately 3 ha, and is broadly categorised into five areas used for description within this EcIA (Figure 8):

1. **Upper embankment:** this forms the intermediate area between the beach and urban landscape (the site for the proposed Moa Point Yard, eastern bank remediation, and the stage 2 kororā colony);
2. **Corner of Stewart Duff and Moa Point Road:** the site for the proposed Moa Point Foreman's Yard;
3. **Moa Point Seawall:** extending from the west, along the southern airport runway property boundary where the seawall remediation will take place;
4. **Kororā colony stage 1:** the site for the proposed stage 1 kororā colony is predominantly on the landward side of Moa Point Road, extending north to south, with some works proposed on the seaward side of Moa Point Road;
5. **Moa Point Beach:** coastal habitat at Moa Point Beach where the 'eastern bank remediation' and stage 2 kororā colony is proposed; and
6. **Lizard release area?**.

Figure 8. Proposed areas of works at Moa Point used for descriptions within this EcIA.

4.1.1.1 Upper Embankment

The upper embankment contains coastal vegetation, rank grassland, rocky structures and areas of bare earth comprised of sandy gravel (Photo 1). The upper embankment is bordered at its northern extent by Moa Point Road, and at its southern extent by Moa Point beach, where the embankment falls away in places with eroding gravel cliff banks, formed on artificial ridges of dumped fill up to 8 m in height.

The vegetation comprises patches of indigenous mixed shrubland/flaxland and rough exotic grassland on reclamation infill, fragmented with walking tracks weaving throughout the embankment, which has compacted the exotic grassland. Indigenous plant species include taupata (*Coprosma repens*), *Muehlenbeckia complexa*, ngaio *(Myoporum laetum*), whaariki (*Phormium cookianum*). Exotic species include saint augustine grass (*Stenotaphrum secundatum*), alyssum (*Lobularia maritima*), karo (*Pittosporum crassifolium*; regionally non-native), tree mallow (*Malva arborea*), African daisy (*Osteospermum fruticosum*), treasure flower (*Gazania linearis*), *Juncus effusus,* and a ragwort species (*Senecio* sp.).

No 'At Risk' plant species were observed during site-visits, but historical records indicate pīngao (*Ficinia spiralis*) was once present, most likely at the eastern end of the beach where suitable sand substrate exists. This area is beyond the proposed Moa Point Yard. No 'Threatened' or 'At-Risk' indigenous species have been found on the beach from recent site assessments by multiple authors (RMA Ecology, 2023; subsequent SNA assessments for Wellington City Council[14]).

The western extent of the embankment comprises a flat area of bare earth, with small patches of grassland on the northern border adjacent to Moa Point Road. Earthworks were undertaken here in early July 2025, which levelled the site and established a yard, and removed approximately 400 m^2 of rank grassland vegetation (as assessed during the April 2025 site survey) (Photo 2).

Photo 1. Upper embankment; (L) coastal vegetation, rank grassland; (R) bordered by Moa Point Road and Moa Point Beach, bare earth and coastal vegetation above an eroding cliff.

[14] https://wellington.govt.nz/-/media/your-council/plans-policies-and-bylaws/district-plan/proposed-district-plan/files/hearing-streams/11/council-reports-and-evidence/council-report-and-evidence/council-evidence/statement-of-evidence-of-nicholas-goldwater.pdf

Photo 2. Areas of vegetation on Site cleared for maintenance works; (top) before works, photos taken April 2025; (bottom) after works, photos taken July 2025. Note top and bottom photos are taken from different locations within the Moa Point site.

4.1.1.2 Corner of Stewart Duff Drive and Moa Point Road

This site is on the landward site of Moa Point Road. It comprises a small carpark and building on the corner and an area of unmanaged grassland which contours upwards towards tall coastal cliffs (Photo 3). The vegetation on Site comprises: 2-3 m karo trees at the base of the cliffs and behind the building, several shrubby taupata, mountain flax, and weedy groundcovers such as creeping groundsel (*Senecio angulatus),* jointed charlock (*Raphanus raphanistrum),* common ivy (*Hedera helix)*, and trailing African daisy. Karo is a plant native to Aotearoa but which has a natural range limited to further north; in the Wellington Region they are considered an invasive pest due to their ability to spread aggressively and outcompete other native plants. No evidence of burrows was seen within the vegetation on site, however refugia (i.e. rubbish and woody debris) is present within the shrubs, and alongside the eastern perimeter which could provide habitat for native lizards.

Photo 3. Examples of the habitat on site at Stewart Duff Drive and Moa Point Road

4.1.1.3 Moa Point Seawall

The rocky coastal habitat comprises the seawall, wave trap, and rear slope as shown in Figure 2. This habitat comprises overlaid concrete blocks, providing the structure of the seawall and the intertidal zone between the upper embankment and Lyall Bay. The 'wave trap' is a large, flattened area, bordered by a large concrete wall separating the southern runway and on the southern extent, the inner seawall structure. Rocks and boulders are overlaid throughout on bare earth which appeared very dry during a site visit with minimal vegetation present (Photo 4). A paved concrete structure (the Lyall Bay Breakwater) extends ~150 m into Lyall Bay from Moa Point Road, forming the border of the seawall remediation site, which is surrounded by boulders on the upper bank, transitioning into larger concrete blocks at depth.

Maintenance works were undertaken here in early July 2025, levelling the site and removing many of the large rocks that lay within the inner seawall and wave trap area (Photo 4). No vegetation was removed to facilitate these works.

Photo 4. (L) Inner seawall and wave trap area seawall looking east, photo taken October 2024; (R) photo taken July 2025 after maintenance works were undertaken.

4.1.1.4 Stage 1 Kororā Colony

This site is approximately 1 km south-east of Wellington International Airport, and is bisected by Moa Point Road, the majority of which exists on the inland side of Moa Point Road. Hue tē Taka Peninsula/Rangitatau Palmer Head, is designated as an area of Outstanding Natural Landscape and Features[15], and includes the entirety of this site. The coastline of Moa Point Peninsula was historically once a Kahikatea-matai/tawa-mahoe forest[16]. Subsequent vegetation clearances have resulted in this site presently being a highly modified landscape with small shrubs, occasional native trees, and weedy groundcovers present.

The eastern inland section of this site is approximately 30 m wide and gradually contours towards a steep cliff face, which forms a natural border between the site and Rangitatau Historic Reserve. Large boulders and rock piles are present at the base of the cliffs formed by erosion of the cliffs, with 2-3 m tall ngaio (*Myoporum laetum*) and karo (*Pittosporum crassifolium)* present intermittently.

Native shrubs such as whaririki/mountain flax, tauhinu (*Ozothamnus leptophyllus),* taupata*,* mingimingi (*Coprosma propinqua*), pōhuehue (*Muehlenbeckia australis),* shrubby tororaro (*Muehlenbeckia astonii*), Wī/silver tussock (*Poa cita*) and coastal shrub daisy (*Olearia solandri*) are present on site. Rough grasses and weedy species proliferate the edges of native vegetation and include species such gorse (*Ulex europaeus*), fennel (*Foeniculum vulgarae*), tree mallow (*Malva arborea*), purple ragwort (*Senecio elegans*), and Marguerite Daisy (*Argyranthemum frutescens*). Fibrous weed suppression mats (2 m x 2 m) surround small native seedlings (<1 m tall) in several areas where restoration efforts have been undertaken.

[redacted]

[15] https://wellington.govt.nz/-/media/your-council/plans-policies-and-bylaws/district-plan/proposed-district-plan/reports/supplementary-documents/boffa-miskell-2019-wellington-city-landscape-evaluation-1.pdf
[16] https://lris.scinfo.org.nz/layer/48289-potential-vegetation-of-new-zealand/

[redacted]).

The western coastal side of Moa Point Road comprises a narrow grass embankment, with the occasional shrubby mountain flax, and taupata along an eroding ~2 m cliff (Photo 5) which falls away to Moa Point Beach. The high tide line appears to reach the cliff, contributing to the ongoing natural erosion of this embankment.

Photo 5. Examples of the vegetation and habitat at the proposed stage 1 kororā colony

4.1.1.5 Moa Point Beach

Moa Point Beach is a narrow beach at high tide, comprising large stones, gravel, infill material, woody debris and sand. Eroding cliffs abruptly partition Moa Point Beach from the upper embankment along its western extent, whereas on its easterly extent, the beach has a higher composition of marine sand and transitions gradually from the upper vegetated embankment to the coastal habitat (Photo 6). The western extent of Moa Point Beach, adjacent to the proposed Moa Point Yard, lacks natural

coastal features such as sand dunes, as this area is anthropogenically formed using infill materials, with stones and sand overlaid from natural tidal currents.

Photo 6. Looking east toward Moa Point beach, and the proposed eastern bank remediation site (2 April 2025). Note that current bank has eroded further since this image.

4.1.2 Vegetation Values at Moa Point

The values of the vegetation at Moa Point as described in Section 4.1.2, shown in Figure 9, and are described below:

Moa Point Yard
Overall, the patches of vegetation within the Moa Point Yard (1940 m^2) consist of regenerating native and exotic grass and scrub. No threatened or At-Risk species are present, and the compositions are generally low in diversity and representativeness. Vegetation values are assessed as **Low.**

Kororā colony stage 1
The restoration plantings undertaken on this site have introduced a higher floral diversity to the area, providing seed source for natural regeneration, and will eventually develop into a mature, coastal ecosystem. However much of the native vegetation on Site is currently fragmented by weeds and grasses, are subject to edge effects as the restoration plantings are young (~2 years old), and have not yet established canopy cover. Natural regeneration may be hindered by the presence of thick grass in places. The vegetation values are therefore assessed as **Low**.

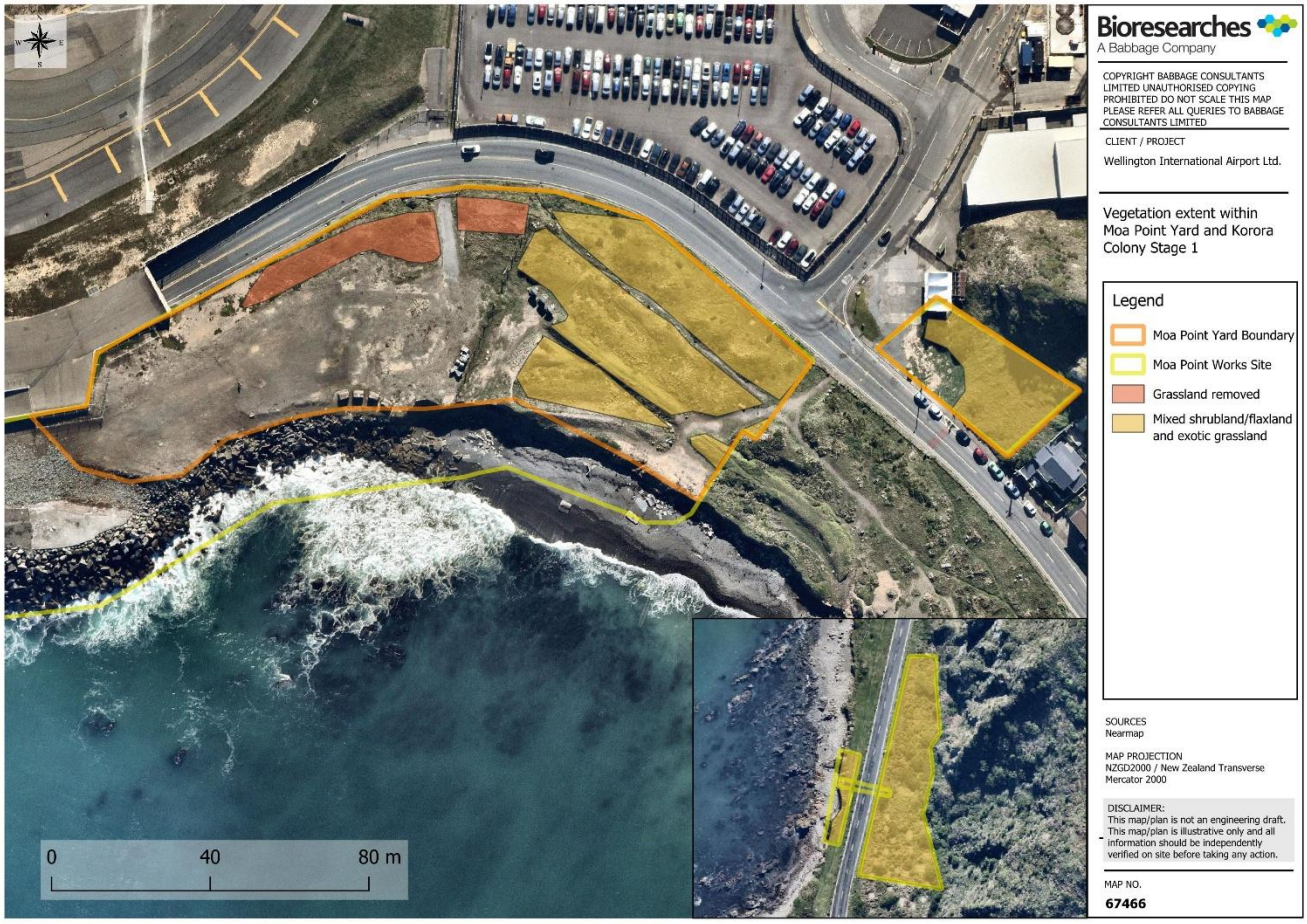

Figure 9. Broad vegetation categories and extent at Moa Point, inset map shows the vegetation at the kororā colony stage 1.

4.1.3 SNA Removal

Following an audit by Wildlands consultants in 2016[17], a proposed Significant Natural Area (SNA ID: WC175) was described at Moa Point beach as a 'gravel dune' system. A subsequent SNA review undertaken by RMA Ecology (RMA Ecology, 2023) raised discrepancies in the assessment, as the back beach 'dunes' appear to be formed by reclamation, comprised of ridges of dumped fill material, soil and gravel, mixed with concrete, brick, tarmac, piping and plastic safety fencing, and are not considered to be naturally formed by wind or wave.

Wildlands Consultants, through the District Plan hearings process (specifically, the Right of Reply for Hearing Stream 11), recommended that the SNA boundary be relocated south-eastwards in recognition of evidence provided by Bioresearches[18]. This SNA alteration was accepted by the

[17]https://wellington.govt.nz/-/media/your-council/plans-policies-and-bylaws/district-plan/proposed-district-plan/files/wellington-city-sna-audit-2016.pdf?la=en&hash=73D2BA1BA7BF3A72581F8C0252F4F49E861F049A

[18] submitter-evidence---m-anderson-for-wial.pdf

District Plan review panel (notified on 7th July 2025[19] [20]), as shown in Figure 10. The Moa Point Works area thereby does not contain any SNAs and is not subject to conditions set out for SNAs.

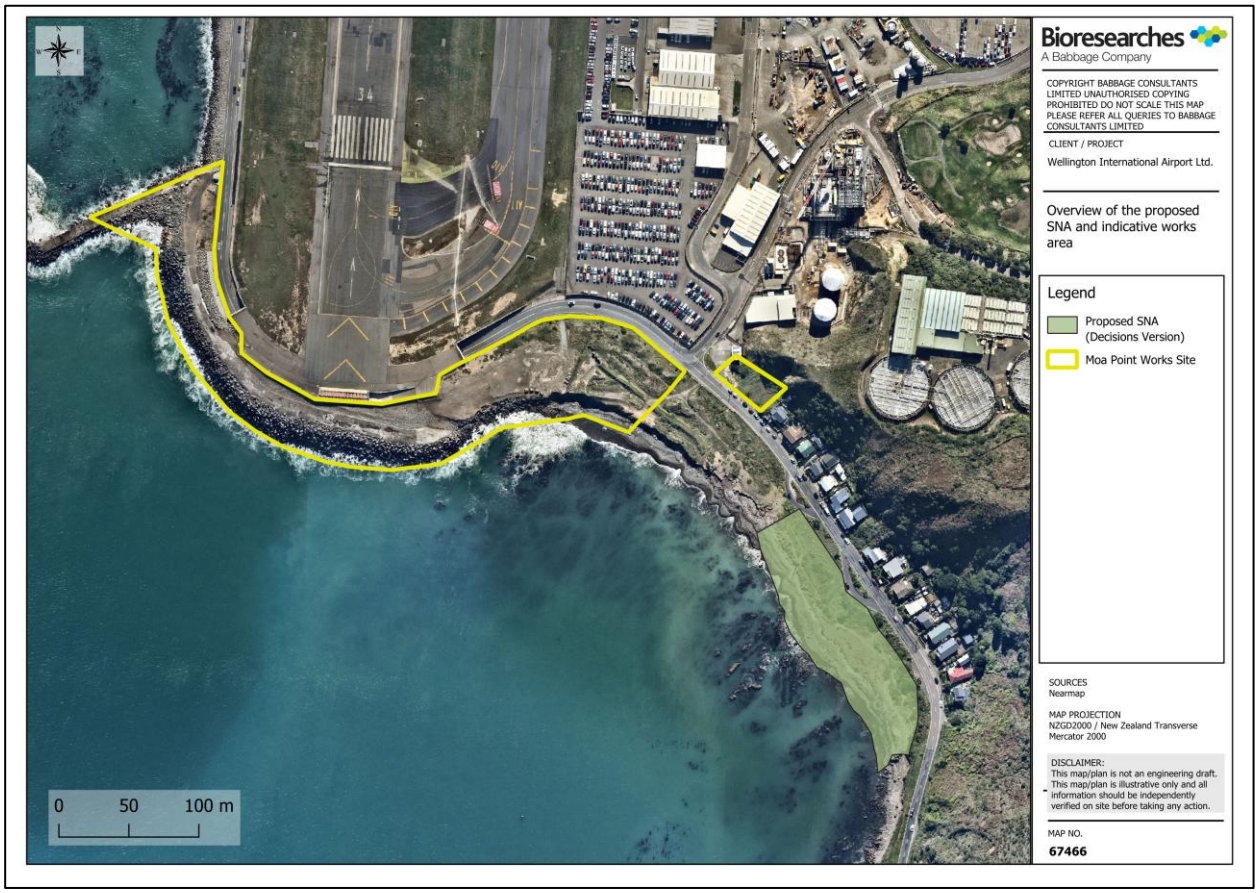

Figure 10. Moa Point proposed SNA (Decisions Version)and indicative works area.

4.1.4 Bats at Moa Point

The Department of Conservation bat database records an 'unidentified' species of bat, 24.5 km north of the Site, short-tailed bats 30.5 km northeast of the site, and long-tailed bats (*Chalinolobus tuberculatus*) are recorded approximately 40 km east of Moa Point within Aorangi Forest Park. Several surveys from the surrounding area have resulted in no bats being detected.

Long-tailed bats have large home-ranges (e.g., 6–471 km^2, with typical core home ranges of c. 50 km^2 (O'Donnell, 2001; Griffiths, 2007) within which they commute, forage, and reproduce. Short-tailed bats have smaller home ranges (e.g., 1.3-62.2km^2) and most individuals travel short distances (e.g., <1 km) between locations (Christie, 2003). Bats utilise habitat features such as vegetated stream corridors for foraging and flight paths, and mature trees (both native and exotic) with habitat features such as loose bark or rot holes as roosts. As Moa Point does not contain these habitat types, is surrounded by a highly urbanised environment, and is adjacent to an active international airport, bats are not considered to be present, even on an intermittent basis.

[19] https://wellington.govt.nz/your-council/plans-policies-and-bylaws/district-plan/proposed-district-plan/hearing-panel-reports-and-briefings-6-11

[20] https://experience.arcgis.com/experience/3a9f7c683662422dad95883b1947259b

4.1.5 Avifauna at Moa Point

4.1.5.1 Desktop review

A review of on-site surveys and desktop analysis identified 52 native avifauna species within a 15 km radius of the Moa Point works area (Appendix C, Table 14). Most of these (29) are specialist marine species (e.g., albatrosses, petrels, shearwaters, fulmars, and storm petrels) and may fly over the area. While such species are not considered to occupy any terrestrial environments on the site, they may be affected by land based disturbances particularly artificial lights at night (ALAN) which has been shown to disorient birds and cause collision, grounding, and increased risk of harm or mortality (addressed in detail in Section 5.1.3).

Twenty-three of these species have potential to use the Moa Point area either intermittently (such as for roosting and/or feeding, as a migratory stop-over), or regularly (including roosting, foraging and breeding). Eighteen of these species have a national or regional conservation status of 'At-Risk' or 'Threatened' (Table 14).

Existing data sets (2022-2024) held by WIAL show that banded dotterel regularly occupies the adjacent airport runway during both the breeding season (up to 8 birds counted) and non-breeding season (up to 40 birds counted). Locations of recorded birds indicate that the southern half of the existing runway (i.e. short grass) is typically occupied by pairs during the breeding season, but not exclusively, as the birds move around.

4.1.5.2 Field Assessments

Three pairs of banded dotterels were observed at Moa Point during the breeding season, either within the proposed Moa Point Yard (1 pair) or adjacent (2 pairs, refer Figure 11). No pairs were nesting within the works area during the visit, but several pairs were observed on short grass alongside the adjacent airport taxiways and runway, on nests. A nest generally consists of a shallow scrape in the ground (soil, gravel, sand), and therefore nesting can occur very quickly. Based on historical records from WIAL (Table 15), an on-site survey during the 2024 breeding season, and records from Mainland Island Restoration Operation (MIRO), the number of breeding dotterel at Moa Point is conservatively estimated at three breeding pairs.

Records of banded dotterel pairs from previous years (and multiple media reports) show that they regularly use bare ground at Moa Point Yard, and / or the short grass alongside the airport taxiway and runway for breeding (Figure 11, Figure 12). Outside the breeding season, larger numbers (up to 40) of birds may congregate at Wellington Airport along the full length of the runway. These open areas offer good habitat because they provide a clear vantage for predator watch and offer nesting opportunities. The banded dotterels here are the only known breeding population of banded dotterels found along the Wellington City coastline east of Sinclair Head[21] and it is notable that they appear to have habituated to aircraft landing and take-off. Banded dotterel pairs are territorial during the breeding season, and can occur in higher concentrations in good habitat (approximately 25m to 150m apart from other pairs[22]), indicating the value and extent of the site is relatively low, based on

[21] https://wellington.govt.nz/-/media/environment-and-sustainability/environment/files/wcc-coastal-bird-survey-report-2022.pdf

[22] Banded Dotterel

the lower density of individuals recorded on the site. Banded dotterels are listed as highly mobile fauna under the NPS-IB. For this species, the habitat value is considered **high.**

No other avifauna have been recorded as breeding at Moa Point Yard. Variable oystercatchers (Nationally At Risk) are known to nest within simple sand scrapes. They may hypothetically utilise Moa Point beach for breeding in future, though that is considered highly unlikely due to the anthropogenic disturbances from the surrounding area and sufficient coastal habitat along the Wellington coastline.

Reef herons (Nationally Threatened) are also known to breed south-west of Moa Point at Taputeranga Island and within Wellington harbour. Though there are no records of breeding at Moa Point, this species may use Moa Point and adjacent marine environment occasionally for feeding and / or roosting, and due to breeding colonies within the surrounding area, there is potential for fledglings and / or juvenile birds to be present in the area.

There is an active breeding colony of spotted shags, red-billed gulls, and white-fronted terns <3 km east of Moa Point at Point Dorset on Miramar Peninsula, which supports the only nesting colony of spotted shag on the Wellington City coastline and is considered part of a regional stronghold for white-fronted tern.

Shags (i.e. black shags, spotted shags, little shags, little black shags) feed predominantly within the marine environment, and have specific breeding requirements, which suggests they are likely to only use the rocky coastal habitat of Moa Point for occasional roosting. Non-threatened species such as black backed gull and white-faced heron may also be found using Moa Point as roosting and/ or feeding grounds.

Wrybill are a domestic migrant and possibly visit Moa Point during their seasonal migration; March – July. Bar-tailed godwits and red knots have been recorded at Lyall Bay and though there are no records at Moa Point, they may occasionally use Moa Point beach for roosting during their seasonal migration to New Zealand between September and March. However, as they usually congregate in large flocks at high tide roosts, and are extremely sensitive to anthropogenic disturbance, it is unlikely they will be found in high-densities or for extended periods of time at Moa Point. For the above avifauna species, the habitat value within Moa Point Yard is considered **low**.

There are several records of NZ pipit within the vicinity of Moa Point. The back-beach and embankment contain a mixture of common native coastal vegetation and long rank grass which can provide nesting habitat for NZ pipit (Regionally 'Vulnerable'). However, use of this area for nesting by NZ pipit is considered unlikely due to coastal environments to the east of Moa Point (e.g., Tarakena Bay) which offer additional breeding opportunities for NZ pipit where there is less urbanisation and surrounding disturbances. Rough open grassland can offer foraging opportunities for non-threatened species such as welcome swallow, though these species are highly mobile and relatively common within the surrounding landscape. Pipit are listed as highly mobile fauna under the NPS-IB. For this species, the habitat value is **low**.

Overall, the potential habitats within Moa Point are considered to provide breeding habitat for banded dotterel and may (but unlikely) support up to three pairs. Moa Point is therefore considered to be **High value for Banded dotterel,** and **low value for other avifauna**.

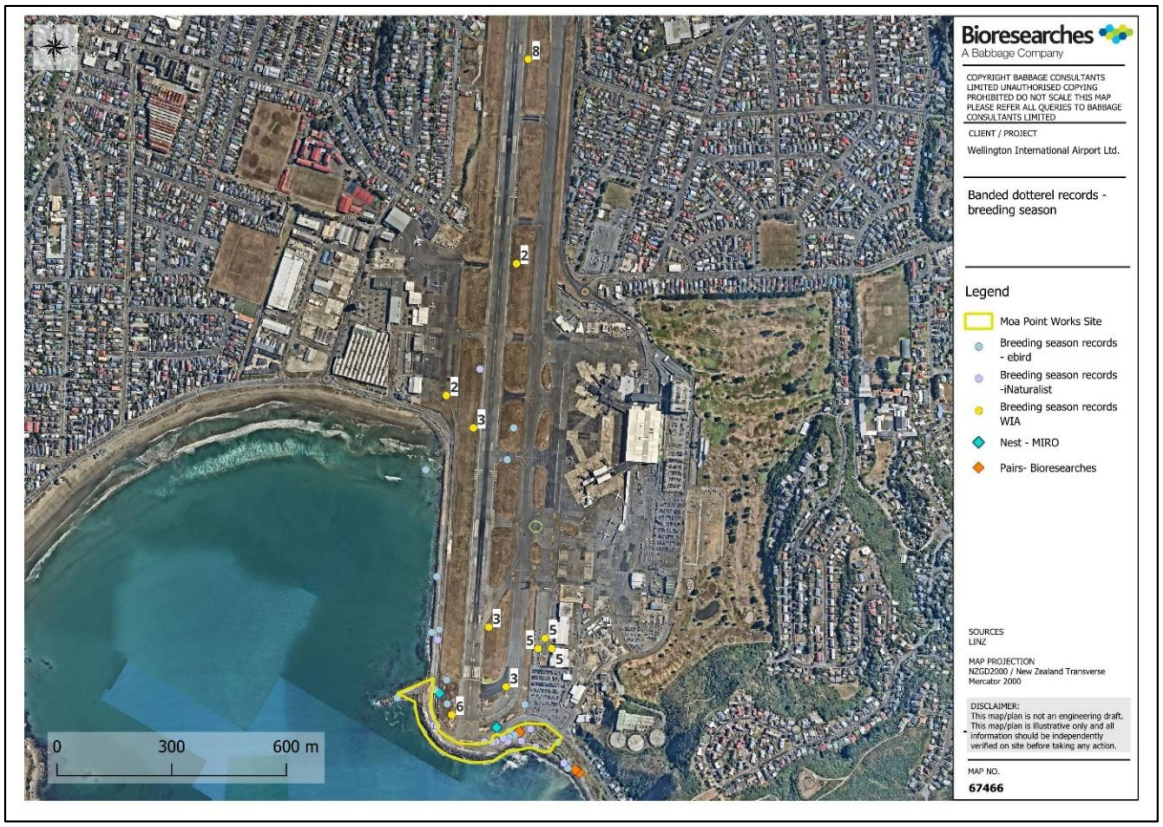

Figure 11. Banded dotterel records during the breeding season (2022-2024). Numbers indicate the number of records of bird presence over a breeding season. Refer Appendix C for details of WIA records.

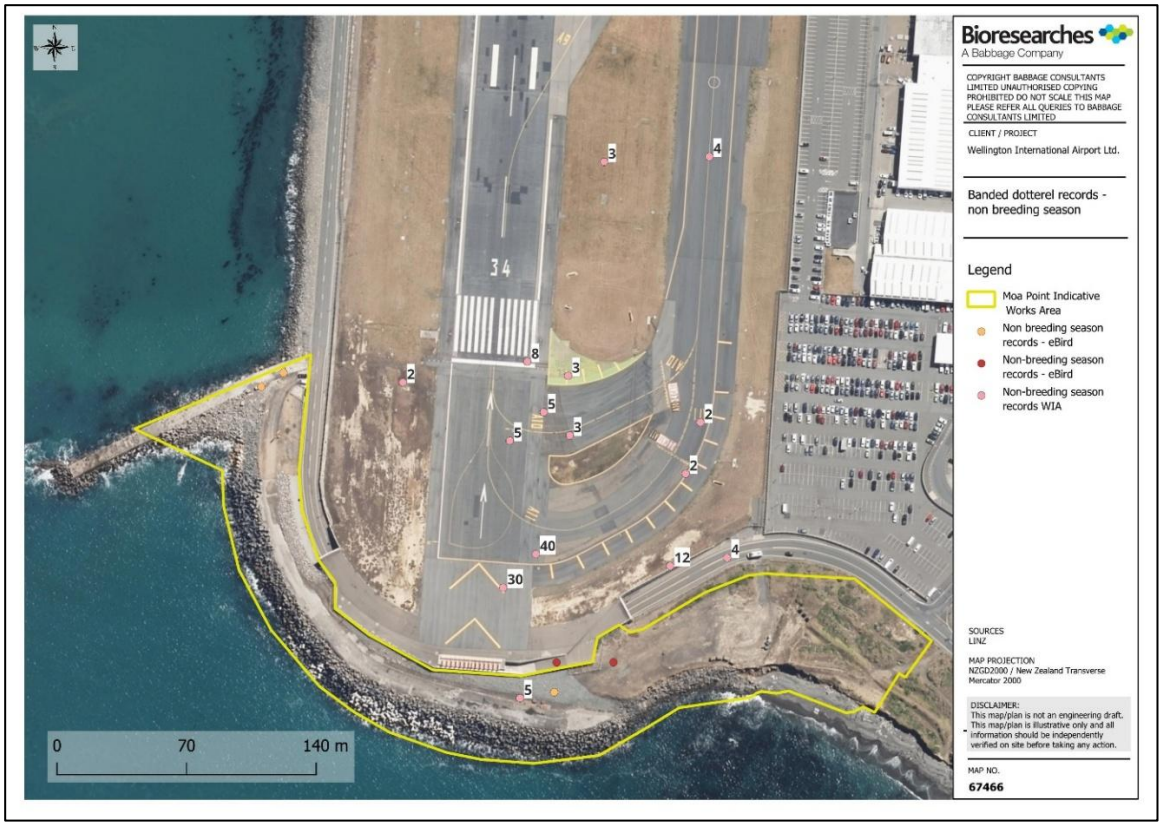

Figure 12. Banded dotterel records outside of the breeding season (2022-2024) adjacent to the works area. Numbers indicate the individual records over the season. Refer Appendix C for details of WIA records.

4.1.6 Herpetofauna at Moa Point

4.1.6.1 Desktop Review

Five native skink species and four gecko species have been recorded within a 5 km radius of Moa Point, detailed in Table 2. Sufficient habitat is available within the coastal vegetation and grassland on the embankment at Moa Point (e.g., rock piles, rank grass, logs, infill debris and coastal vegetation) to support populations of native skinks, whilst terrestrial saxicolous (rock-dwelling) species may inhabit rockpiles and infill debris within Moa Point. Species may include threatened or at risk (TAR) species such as brown skink, copper skink, ornate skink, northern spotted skink, and minimac geckos as they have been recorded within 5 km of the site (Table 2).

Non-native plague skinks (*Lampropholis delicata*) have potential to be on site and have been detected 1.5 km north of Moa Point. Three other species have been detected within a 5 km radius: brown tree frog (*Litoria ewingii*), green and golden bell frog (*Ranoidea aurea*), and southern bell frog (*Ranoidea raniformis*), but are unlikely to occur on site due to limited habitat availability.

Table 2. Native herpetofauna identified on site and potentially present based on habitat suitability and desktop survey at Moa Point. National threat status: Hitchmough et al, (2021), Regional: Crisp et al (2023); *RMA Ecology (2023), and 2025 Bioresearches herpetofauna survey.

Common Name	Scientific Name	National Threat Status	Regional Threat Status	Recorded on site*	Recorded within 5km from site	Potential habitat present on site
Glossy brown Skink	*Oligosoma zelandicum*	At Risk - Declining	At Risk - Declining		✓	✓
Copper skink	*Oligosoma aeneum*	At Risk - Declining	At Risk - Declining		✓	✓
Ornate Skink	*Oligosoma ornatum*	At Risk - Declining	At Risk - Declining		✓	✓
Minimac Gecko	*Woodworthia "Marlborough mini"*	At Risk - Declining	At Risk - Declining		✓	✓
Ngahere gecko	*Mokopirirakau "southern North Island"*	At Risk - Declining	At Risk - Declining		✓	
Barking gecko	*Naultinus punctatus*	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	✓	✓	✓
Raukawa Gecko	*Woodworthia maculata*	Not Threatened	Not Threatened	✓	✓	✓

4.1.6.2 Field Assessments

During installation of survey equipment, Northern grass skink (Photo 7) were visually abundant throughout all areas of vegetation surveyed, including within the Moa Point laydown yard and proposed stage 1 kororā colony. Raukawa gecko skin slough (shed skins), and lizard scat (Photo 7), were recorded at multiple locations along the Moa Point embankment, and coastal vegetation, where the stage 1 kororā colony is

[redacted]

Photo 7. Evidence of lizard presence at Moa Point, found during the survey; (top left) northern grass skink, (top right) Raukawa gecko, (bottom left) gecko slough, (bottom right) lizard scat.

The herpetofauna survey identified skink prints on eight of the twenty-four tracking tunnels and gecko prints on one tracking tunnel along the Moa Point Peninsula (Figure 25, Figure 26, Table 16). Onsite observations offered a more definitive understanding of lizard fauna values at Moa Point than tracking tunnel data, both for species identification and spatial distribution. Tracking tunnel data was compromised by degradation of tracking cards due to snail damage, and therefore this aspect of the survey underrepresented lizard presence. It is therefore considered that both species are present throughout all vegetation at Moa Point (Photo 8), including within the proposed construction yard where dense ground cover vegetation is present. The inside of the sea wall is a barren exposed landscape (Photo 9) and no lizard presence was detected here during the herpetofauna tracking tunnel survey. As such, it is not expected for native lizards to be present within this area.

While survey and searches did not identify any other species, both northern grass skink and Raukawa gecko have previously been recorded at Moa Point. Therefore, the results of this survey provide confidence in the identified values, and stronger understanding of spatial distribution at Moa Point. While other species cannot be ruled out, they are considered less likely to be present given the numerous logs and rocks lifted during searches (and noting that works at the nearby Te Whare Wai Para Nuku, Sludge minimisation facility resulted high numbers of both species being relocated, but no other species detected).

Overall, the herpetofauna values at Moa Point are represented by two Not-Threatened (low value) species. 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. While up to five other species remain potentially present (coastal environments can support higher lizard diversity), the apparent lizard diversity is low. While a low diversity, supporting common native species is expected, a precautionary **Moderate ecological value has been assessed for herpetofauna**, on the basis that other potentially present species not recorded from survey would have high value (Table 2).

Photo 8. Coastal vegetation and rock piles along the embankment which can

Photo 9. Inside of the seawall (looking east) at Moa Point showing a barren

provide suitable habitat for native gecko and skink species.	*exposed landscape unsuitable for herpetofauna*

4.1.7 Invertebrates at Moa Point

The desktop analysis indicated one threatened invertebrate species within a 2 km radius of the site; the Cook Straight giant weta (*Deinacrida rugosa – 'Nationally Vulnerable'*[23]), which aside from within fenced sanctuaries, is not considered present on the mainland. This species is therefore not considered to be present on site. Other invertebrates recorded from site assessments included common native isopods (sand hoppers), the grasshopper (*Phaulacridium marginale*) and coastal earwig (*Anisolabis maritima*)- all indigenous, Not Threatened species. The ecological value of the terrestrial invertebrate fauna is assessed as **Low** and as such, will not be discussed further.

4.1.8 Summary of ecological values at Moa Point

A summary of values at Moa Point, as described above, is presented in Table 3 below.

Table 3. Summary of fauna and flora values at Moa Point.

Vegetation	Bats	Avifauna	Herpetofauna	Invertebrates
Low Suite of common native and exotic species. Not TAR species likely to be present.	**NIL**	**High (banded dotterel)** **Low (other avifauna)** A known breeding site for banded dotterel. Potential for roosting habitat for other TAR species (e.g., reef heron) or intermittent use by NZ pipit.	**Moderate** Not Threatened grass skink and raukawa gecko populations are present within dense ground cover vegetation and rocky coastline habitats. TAR Copper skink may also be present on Site.	**Low** Suite of common native and exotic species. No terrestrial TAR species likely to be present.

4.2 Miramar Golf Course

Historically Miramar Golf Course was vegetated with kahikatea-matai/tawa-māhoe forest[24] but by 1938 (the earliest historical image available for the site[25]), most of the vegetation had been cleared in favour of pasture, with remnant vegetation remaining only within the central, south east and eastern boundaries of the site (Figure 13). By the early 1960s, the pasture surrounding Miramar Golf Course had mostly been replaced by urbanisation and industrialisation, and by 1988 the remaining vegetation had been converted to become the Miramar Golf Course. The Miramar Golf Course has existed in different forms on the site since 1908[26], indicating the loss of original vegetation occurred more than 100 years ago. Most of the amenity plantings on site appear to have been planted after 1988. Land Cover Data Base (LCDB v5.0) indicates that the landcover for the southeastern area adjacent to the site where the landscape buffer zone is designated was '*broadleaved indigenous hardwoods'*, whilst Miramar Golf Course itself is

[23] https://www.doc.govt.nz/globalassets/documents/science-and-technical/nztcs39entire.pdf
[24] https://lris.scinfo.org.nz/layer/48289-potential-vegetation-of-new-zealand/
[25] Retrolens, https://retrolens.co.nz/
[26] https://www.miramargolfclub.co.nz/

currently classified as '*urban parkland/open space'*. The area at Miramar Golf Course has a Threatened Environment Classification of < 10% indigenous cover left[27].

Figure 13. Miramar Golf Course historic images; 1938, 1954, 1988, and 2021.

4.2.1 Vegetation at MGC

Vegetation types within the proposed MGC Yard consists of non-maintained exotic grassland (~0.57 ha) and a small patch of karo treeland and scrub (~0.014 ha) adjacent to the central irrigation pond (Figure 14). The remainder of the site is maintained mown grassland (~3.7 ha) with planted trees present either as solitary trees or planted in rows.

Isolated pōhutukawa (*Metrosideros excelsa* – 'Not Threatened', 5-6 m tall) are present within the MGC Yard (Photo 10). Pōhutukawa are not natural to the Wellington region[28], although they are abundant throughout the Wellington region as an 'introduced' species. These trees have not been included in vegetation mapping but are considered in the overall vegetation and habitat values of the site.

[27]https://ourenvironment.scinfo.org.nz/maps-and-tools/

[28] de Lange, P.J. (2024): Metrosideros excelsa Fact Sheet (content continuously updated). New Zealand Plant Conservation Network. https://www.nzpcn.org.nz/flora/species/metrosideros-excelsa/

Photo 10. Isolated pōhutukawa trees are scattered throughout the golf course.

Exotic grassland

This vegetation type is seen in various areas throughout the golf course where exotic grasses have been left to serve as the 'rough' during play, occurring separately or along in association with boundary margins (Photo 11) and / or treeland vegetation margins. The dominant species are a mix of exotic grasses such as red fescue (*Festuca rubra var. rubra*), prairie grass (*Bromus catharticus)*, cocksfoot (*Dactylis glomerate), tall fescue (Lolium arundinaceum),* and annual poa *(Poa annua)*. Other species commonly found throughout the rank grass include knobby clubrush (*Ficinia nodosa*), rahurahu (*Pteridium esculentum*), fennel, gorse, kokihi (*Tetragonia tetragonoides*), pampas (*Cortaderia selloana*) and the occasional scrubby karo. This vegetation type also occurs underneath the pōhutukawa trees in several locations.

Photo 11. Rank grasses on site and vegetation on the southeastern embankment.

Karo Treeland and scrub

A small patch of karo treeland exists (0.014 ha) near the irrigation pond (characterised as treeland) within the proposed MGC Yard. It contained only karo in the canopy, and no subcanopy or herb layer existed under the trees but rather the trees were surrounded by an area of rank exotic grass. That small patch is

the only karo treeland and scrub that will be removed for the establishment and operation of the MGC Yard. Karo treeland and scrub also exists outside of the Site to the southwest, however it is fenced and is not proposed for removal for facilitate the works at MGC Yard.

Overall, the vegetation within the MGC Yard itself consists of highly modified and maintained short grass and amenity trees, with an exotic-dominant composition. No Threatened or At-Risk species are present and the compositions are very low in diversity and representativeness. The vegetation values within the MGC Yard are assessed as **Negligible**.

Figure 14. (below) Miramar Golf Course vegetation presence and distribution, within the MGC Yard site boundary.

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Vegetation extent within the Miramar Golf Course Yard

Legend

- MGC Yard Boundary
- Karo treeland and scrub
- Exotic grassland

SOURCES
Nearmap

MAP PROJECTION
NZGD2000 / New Zealand Transverse Mercator 2000

DISCLAIMER:
This map/plan is not an engineering draft. This map/plan is illustrative only and all information should be independently verified on site before taking any action.

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4.2.2 Bats at MGC

The Department of Conservation bat database (June 2025 version) records an 'unidentified' species of bat, 24.5 km north of the Site, short-tailed bats 30.5 km northeast of the site, and long-tailed bats (*Chalinolobus tuberculatus*) approximately 40 km east of the Site within Aorangi Forest Park. Several surveys from the surrounding area have not detected any bats.

Large mature pōhutukawa and Norfolk pine trees are present across the golf course and may provide roosting opportunities for bats, however these are generally isolated trees within an otherwise highly urbanised (high light, noise) environment with minimal connectivity to larger forested habitats. It is therefore considered highly unlikely that either long-tailed bats or short-tailed bats are present (intermittently or permanently) at the MGC.

4.2.3 Avifauna at MGC

Review of in-field surveys and desktop analysis found thirty-one native avifauna species recorded within a 15 km radius of the site that could potentially be present based on habitat suitability (Table 14). Of the thirty-one species recorded, twenty-nine may be present within Miramar Golf Course within suitable habitat, either as intermittent visitors or using the site for breeding. These species are discussed below.

Some 'At Risk' species may use the open golf course or adjacent embankment areas for intermittent roosting, or potentially opportunistic feeding. These species include silver gull, banded dotterel and variable oystercatcher, which may roost on the open greens where and when anthropogenic disturbance allows. The mature pōhutukawa within the proposed MGC Yard offer some limited feeding and / or nesting opportunities for non-threatened birds (e.g., tūī *Prosthemadera novaeseelandiae* and fantail *Rhipidura fulginosa)*.

Rough grass areas higher up the embankment and adjacent to the proposed yard works area may provide for roosting or nesting habitat for New Zealand falcon (*Falco novaeseelandiae*) and New Zealand pipit (*Anthus novaeseelandiae*) and as such, they may be present within the works area. Several falcon pairs are known to breed in the Wellington townbelt and have foraging territories that include the surrounding environment, including the central city. While possible, such habitat use by these species is unlikely as pipit are more likely to nest nearer their foraging habitats in rough open pastures or coastal environments (e.g. Tarakena Bay). Falcon may nest in a variety of habitats including hilly tussock or rough grassland land to mature forest (including pine plantation). Such habitats are abundant throughout the Wellington region, and the adjacent Rangitatau Historic Reserve supports large areas of similar potential habitat.

The karo treeland and scrub within the Golf Course and adjacent south-eastern embankment supports a mixture of common native plantings and exotic weedy species regenerating throughout. This vegetation, and the pōhutukawa trees scattered across the golf course, likely supports some limited foraging, roosting and nesting habitat for common native species, including tui, kererū (*Hemiphaga novaeseelandiae*) silvereye (*Zosterops lateralis*), fantail, grey warbler (*Gerygone igata*), kingfisher (*Todiramphus sanctus*) and bellbird (*Anthornis melnura*). Additionally, a pair of paradise shelduck ('Not Threatened') with several chicks were observed using the pond and golf course as feeding / roosting habitat during the 2024 site visit. All of these species are widespread and have been recorded within the surrounding environment.

In summary, a range of 'At Risk' and 'Threatened' bird species have been recorded in the surrounding landscape; however, these species are generally all strongly associated with coastal habitats, for which the environment at Miramar Golf Course provides negligible to low habitat value. Intermittent roosting or foraging could be expected by other TAR species, including falcon and pipit, however the MGC is unlikely to be an important habitat resource for these species. Overall, the habitat for avifauna at Miramar Golf Course is of **low value**.

Marine birds, while not present within terrestrial environments, may intermittently pass over the construction sites at night, and are generally of **high value (Appendix C)**.

4.2.4 Herpetofauna at MGC

Desktop Assessment

Five native skink species and four gecko species have been recorded within a 5 km radius of the site, as detailed in Table 4. Of these, there is also potential for raukawa gecko and all skink species to occur within suitable habitat at Miramar Golf Course, four of which are 'At-Risk' species. [redacted] Both of these species would therefore be expected to be present where similar exotic grass and scrub-type habitat occurs.

Non-native plague skinks have potential to be on site and have been detected 1.5 km north of the site. Exotic brown tree frogs, green and golden bell frogs, and southern bell frogs may be present near waterbodies on site.

Table 4. Herpetofauna identified on site and potentially present based on habitat suitability and desktop survey at Miramar Golf Course. National threat status: Hitchmough et al, (2021), Regional: Crisp et al (2023); *2025 Bioresearches herpetofauna survey.

Common Name	Scientific Name	National Threat Status	Regional Threat Status	Recorded on site*	Recorded within 5km from site	Potential habitat present on site*
Glossy brown Skink	*Oligosoma zelandicum*	At Risk - Declining	At Risk - Declining		✓	✓
Copper skink	*Oligosoma aeneum*	At Risk - Declining	At Risk - Declining		✓	✓
Ornate Skink	*Oligosoma ornatum*	At Risk - Declining	At Risk - Declining		✓	✓
Minimac Gecko	*Woodworthia "Marlborough mini"*	At Risk - Declining	At Risk - Declining		✓	
Ngahere gecko	*Mokopirirakau "southern North Island"*	At Risk - Declining	At Risk - Declining		✓	
Barking gecko	*Naultinus punctatus*	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		✓	✓
Raukawa Gecko	*Woodworthia maculata*	Not Threatened	Not Threatened	✓	✓	✓

*Potential habitat refers to rough exotic grass edges of the MGC

4.2.4.1 Field Assessment

Native skink footprints were recorded in five of the twenty-one tracking tunnels during the April 2025 herpetofauna survey, in areas of rough exotic grass along the edge of the MGC (Table 17, Figure 26). No lizards were observed during field investigations within MGC, and no Raukawa gecko prints were recorded here.

Rough grassland (e.g., edges of golf course), and particularly areas where there is refugia debris (e.g., rock piles, logs, or leaf litter) provide suitable habitat for native lizards. These areas are indicated in Figure 14, and present at the time of survey.

Overall, the lizard habitats consist of rough, exotic grasses which are isolated to the outer margins and steep contours of the currently maintained golf course, and support Not-Threatened northern grass skink (detected) and potentially also Not Threatened Raukawa gecko (not detected, but recorded at adjacent works at Sludge minimisation facility). As there are higher habitat values within the adjacent Tukanae Reserve, and grassland areas provides little habitat complexity or resource, the value of these habitats to herpetofauna is assessed as **Low**.

4.2.5 Invertebrates at MGC

The desktop analysis resulted in one threatened invertebrate species within a 2km radius of the site; the Cook Straight giant weta (*Deinacrida rugosa – 'Nationally Vulnerable'*[29]*),* which aside from within fenced sanctuaries, is not considered present on the mainland. This species is therefore not considered to be present on site. Other invertebrates are expected to be comprised of a typical suite of common native and exotic invertebrates that occur with rough exotic grassy edges. That is, not threatened or at risk invertebrates are considered to be present within this environment, even on an intermittent basis. The value of the habitats to invertebrates is assessed as **Low,** and none are have any legal protection under the Wildlife Act. As such, invertebrates are not discussed further.

4.2.6 Freshwater Habitats at MGC

Freshwater habitats within the southern half of the MGC were assessed. Within the southern half of the golf course, one small NPS-FM 'natural inland wetland' was identified and delineated following the Ministry for the Environments delineation protocols for natural inland wetlands,[30] and one artificial irrigation pond was classified in the centre of the assessment area (Figure 15). Although the constructed irrigation pond is located within the proposed MGC Yard site, the natural inland wetland is located outside of the proposed MGC yard (but within 100 m of the yard).

Predicted overland flow paths are considered to be ephemeral or absent within the southern half of the Miramar Golf Course. No other aquatic habitats have been identified as present within 100 m of the MGC Yard boundary.

4.2.6.1 Natural Inland wetland

The wetland is located approximately 45 m north-east of the MGC Yard boundary. The site where the wetland exists appeared as no more than minor saturation prior to 2018, with no evidence of the wetland

[30] **Ministry for the Environment. 2022.** Wetland delineation protocols. Wellington: Ministry for the Environment

existing in aerial imagery. The natural inland wetland consists of a small patch of rushes, present in a depression in the centre of the site which appear to have been induced through human activity. At the time of the first site visit the small depression the wetland had formed in appeared to be left as 'rough' and was fed by water from the animal hutch located under the trees immediately adjacent, and by irrigation. The area of rush has increased by 2025 to an area measuring approximately 40 square metres (Photo 12). The wetland has no habitat for native fish although it could be visited by birds on an intermittent basis. The wetland is bordered by exotic grassland habitat, dominated by exotic pasture species (>50%) which is intermittently mown, and offers little in the way of riparian function to the wetland.

The vegetation within this inland wetland comprises *Machaerina articulata* (OBL), an obligate wetland species, and *Juncus pallidus* and *Juncus sarophorus*, both facultative wetland (FACW) plants. As the area passed the Rapid Test for hydrophytic vegetation (Rapid Test: all dominant species across all strata are rated OBL and/or FACW[31]), and even though the wetland appears to have been induced, none of the exclusions under the NPS-FM apply, therefore the area meets the criteria for a 'natural inland wetland'.

Photo 12. Small natural inland wetland , with Juncus sp. identified by Bioresearches (2022) and PDP (2023). Photos by Bioresearches from August / September 2024 during a Site visit.

Representativeness

The wetland is likely induced through human activity and is set in a highly modified environment within a golf course; due to a complete lack of connectivity to other freshwater (or marine) habitats, the wetland lacks both flora and fauna characteristics of a naturally occurring wetland ecosystem. The wetland also has a riparian buffer consisting of grassland, which is frequently mown. The wetland does offer some limited filtering of water; but is highly susceptible to edge effects and has increased exposure to temperature fluctuations, wind, light and weeds. The wetland has a tenuous shape, and consequently the area-to-perimeter ratio of the wetland is relatively low, indicating there is little 'interior' of the wetland which is not subject to these effects. The wetland is considered **low** for representativeness.

Rarity and distinctiveness

No 'Threatened' or 'At-Risk' flora or fauna species were identified within the wetland. The fauna species assemblage present is also expected to be highly modified and predominantly, if not entirely restricted to non-sensitive species. It is not expected the wetland would provide suitable permanent habitat for

'Threatened' or 'At-Risk' wetland birds (such as fernbird or banded rail, neither of which have been recorded within 15km of Miramar Golf Course during the desktop assessment), as the vegetation lacks complexity, the wetland is poorly buffered from nearby anthropogenic activities, and is very small. In addition, these are often poorly flighted species and the lack of connectivity to other habitats means their presence is highly unlikely. The wetland is considered **negligible** for rarity and distinctiveness.

Diversity and pattern

The wetland has one dominant vegetative tier and species, which limits its diversity both in terms of vegetation and in the provision of microhabitats for flora and fauna. Because of the highly modified, predominantly exotic vegetation community, the wetland is limited in how it can provide food resources to native fauna – there is little in the way of nectar or fruit bearing plants for native birds or lizards, and the lack of hydrological variation (discussed further below) provides no habitat availability for native fish. The wetland also is very small and linear, which leaves it vulnerable to edge effects such as light, temperature, noise and wind. The wetland is considered **low** for diversity and pattern.

Ecological Context

The vegetation type was uniform throughout the wetland, with a low diversity of flora present, and a single herbaceous vegetation tier, with no trees or other structural tiers present. The wetland has a very limited riparian buffer which, aside from limited filtration, does very little to buffer the wetland from edge effects. The wetland has no upstream or downstream hydrological linkages and is also separated from other more extensive local areas of wetland habitat by its bunded, managed grassland surroundings, and lacks any linkages to indigenous terrestrial habitats. The wetland is considered **negligible** for ecological context.

Overall the wetland value is considered of **low** value**.**

4.2.6.2 Water storage pond

A large water storage pond is located within the MGC Yard site boundaries (Photo 13). The storage pond is constructed, lined and well maintained for water use for the Golf Course, including irrigation. It is not a wetland and does not meet the NPS-FM criteria for a 'natural inland wetland', as it is clearly constructed, lined, and in current use, and meets exclusion (b) in the definition of a natural inland wetland;

> (a) a deliberately constructed wetland, other than a wetland constructed to offset impacts on, or to restore, an existing or former natural inland wetland.

The edges of the pond are lined, and no macrophytes or connection with edge vegetation was observed during the site visits. Although no surveys for native fish were carried out in the pond, native shortfin eel (*Anguilla australis*) cannot be excluded as present, as the pond is large, has been present for more than 25 years and eels will travel overland to aquatic habitats. As the pond is not representative of a naturally occurring freshwater ecosystem, and has no connection with other aquatic habitats, it has been assigned a **negligible** ecological value.

Photo 13. Water storage pond used for irrigation on Miramar Golf Course.

Figure 15. (below) Inland wetland and water storage pond location at the Miramar Golf Course.

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Natural inland wetland and pond location at MGC

Legend

- MGC Yard Boundary
- Inland wetland
- Pond

SOURCES
Nearmap

MAP PROJECTION
NZGD2000 / New Zealand Transverse Mercator 2000

DISCLAIMER:
This map/plan is not an engineering draft. This map/plan is illustrative only and all information should be independently verified on site before taking any action.

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4.2.7 Summary of Ecological Values at MGC

A summary of values across the various terrestrial habitats and fauna types as discussed in the above sections at Miramar Golf Course is provided below in Table 5. An ecological value of the habitat is then summarised based on the combined vegetation and fauna values as per Table 9 of the EIA methodology.

Table 5. Summary of terrestrial and freshwater values at MGC Yard.

Vegetation	Bats	Avifauna	Herpetofauna	Invertebrates	Freshwater
Negligible Predominantly exotic grass (rough and maintained, and amenity trees)	**NIL**	**Low** Supports common-non-threatened birds, and may periodically support TAR species (e.g., NZ pipit, karearea), although highly unlikely to be important habitat or frequently visited.	**Low** Supports Not-Threatened skink and gecko populations within rough edge grasses	**Low** Suite of common native and exotic species. No TAR species likely to be present.	**Low** Wetland value; offline wetland, lacking flora and fauna characteristics of a naturally occurring wetland ecosystem, unlikely to support fauna inhabitation. **Negligible** pond value; not a naturally occurring ecosystem.

5 ASSESSMENT OF ECOLOGICAL EFFECTS

This assessment of effects on ecological values has been undertaken in accordance with Ecological Impact Assessment Guidelines (EcIAG) produced by the Environment Institute of Australia and New Zealand (EIANZ; Roper-Lindsay *et al*., 2018, and refer Appendix B, Table 12 and Table 13) and adapted based on expert opinion. The following section outlines the magnitude of effects and subsequent level of effects of the Project on those values.

5.1 Indirect effects

It is likely that the proposed Project will result in the following indirect disturbance effects to fauna and flora within the surrounding environment. The indirect effects management recommendations and summary of effects are described in Section 6.4.

5.1.1 Edge Effects

Edge effects describe changes to a habitat or ecosystem due to its occurrence at or near the edge or boundary of that environment. Edges are generally considered to experience increased exposure to light, wind, temperature variation, and pest animal and weed encroachment. Edge effects resulting from edge creation are generally considered to have a degradative impact, particularly for stable environments such as forest interiors. However, some species have adapted to edge type environments, particularly those that occur in coastal habitats and those recorded within the Project area (e.g. coastal birds, lizards, plant species). Potential and known habitats at MGC and Moa Point Yards, and the seawall area are all edge environments and are not considered likely to be degraded by new edge creation. Potential edge effects on flora and fauna are considered to be **negligible**.

5.1.2 Noise and vibration

The Project will introduce additional noise and vibration to the surrounding environment. Noise has been shown to affect biodiversity as it can impede communication, decrease reproductive success, change foraging behaviours, decrease the ability to detect predators, initiate flushing responses and increase avoidance behaviours (Harbrow et al, 2011). The effects of vibration have been shown to disrupt animal behaviours, communication and physiology, especially in species that rely on acoustic or auditory signals (Cross et al, 2021).

As per the noise assessment report (Tonkin+Taylor, 2025a), the noise levels expected at Moa Point are as follows:

- Occur at a different time to existing activities, due to construction activity occurring during the night (12 am-6 am) when regular flights are not arriving or departing the airport;
- On shore rock-milling and micro piling is required for the remediation of the seawall at Moa Point. Rock-milling is expected to output 80 dB LAeq(15 min) at 10 m, and micro piling 80 dB LAeq(15 min) at 10m. Further, modelled noise scenario ('worst-case') within the seawall works area is expected to be 114 dB for the operation of a 90t excavator.

As per the noise assessment report (Tonkin+Taylor, 2025a), the noise assessment for the Project ('worst-case') modelled within the MGC Yard are expected to range between activities: 107-113dB (wheeled loader) and 113dB (bulldozer D8 CAT).

Potential noise mitigation (implementation of a noise barrier) was investigated through the consultation of a noise specialist (email communication; Martyn Chambers, July 2025). The construction of a noise barrier was not feasible as it would be limited to <2 m due to Wellington Airport health and safety requirements, and would have minimal effect due to several factors:

- For a barrier less than 2 m, the decibel reduction would be negligible (~1.8 dB reduction) and only where the noise source is directly behind a noise barrier; and
- With a 2 m wall adjacent to the MGC Yard, the reduction would be 5–8 dB closer to the noise barrier and nominal near the top.

Noise management are proposed within the noise assessment to mitigate potential noise effects and include measures such as:

- Installing noise redactors and low impact beepers on on-site plant;
- Using equipment (for example, sand mats) to reduce the noise of rock being unloaded to ground;
- Switching engines off for extended periods; and
- No sudden acceleration or braking.

Coastal birds inhabiting the Project site are currently subjected to existing airport traffic noise and vibrations, and have adapted to this environment, continuing to utilise the airport grassland for breeding and inhabitation. Results from two spot noise measurements (March 2024 and December 2023) across various locations adjacent to the Project areas, shows the existing noise adjacent to the MGC Yard ranges between 35-76 dB (measured at Bunker Way and Rauwaka St), whilst the noise measured at Moa Point ranges between 49-77 dB (Tonkin+Taylor, 2025a).

Lizard species that inhabit rough grass habitats are often present within modified habitats such as roadsides and suburban environments and are somewhat resilient to disturbances[32].

Banded dotterels are also adaptable to modified environments and are known to nest in highly disturbed areas such as construction sites, earthworks sites and urban parklands. Within the urban environment, terrestrial avifauna have been found to increase their song frequency and volume, in response to anthropogenic noise[33], thereby showing an ability to adapt to their environment. Such adaptations can be energy consumptive however, and fauna are most sensitive to anthropogenic disturbances such as noise and vibration during critical life-history stages, such as during moult and breeding, causing them to flee, leave the nest or displace them to another site.

Measures to prevent breeding coastal avifauna (i.e. banded dotterel, variable oystercatcher) from nesting within the Moa Point works areas and being adversely affected by noise/vibration from the Project are recommended, as discussed later in this report and with details in the Avifauna Management Plan. Where nest deterrence fails and coastal avifauna successfully nest within the works area (i.e. Moa Point Yard), a 50 m exclusion zone will be implemented around the nest, until the chicks hatch, or the nest naturally fails. Potential effects on terrestrial avifauna can be managed by implementing a 20 m

[32] https://www.reptiles.org.nz/herpetofauna/native/oligosoma-polychroma

[33] https://www.sciencedirect.com/science/article/pii/S2589004224002773?ssrnid=4573264&dgcid=SSRN_redirect_SD

buffer around any nest found on Site. These recommendations are further detailed in and described in Section 6.3.

If the above recommendations are followed, the potential effects are considered to be **low**, and no other mitigation measures are required.

Based on Table 13 of the EIANZ guidelines (EIANZ, 2018), and the Project's anticipated timeline, the effects at Moa Point are expected to be temporary and short term (up to 5 years), whilst the effects at Miramar Golf Course are temporary and medium term (5-15 years).

5.1.3 Lighting

The project will introduce additional lighting to Moa Point and Miramar Golf Course to facilitate the proposed project. Specifically, this will include mobile construction lighting, mobile light towers, vehicles headlights, security lighting fixed to buildings, and machinery lighting (Leading Design Professionals, 2025), all of which is temporary and will only be used for the duration of the project.

Specifically, lighting used for the Project will include the following:

Moa Point

- Overnight (i.e. outside airport operating hours) the Southern Seawall construction site will be illuminated with up to ten portable lighting towers;
- For works between 6am and dawn, and dusk and 10pm on the Eastern Bank Remediation, up to 13 portable lighting towers will be used to ensure work areas are safely lit;
- At both the Eastern Bank Remediation and Southern Seawall construction site, additional lighting will also be fixed to mobile plant and vehicles to illuminate working areas, and will include headlights from light vehicles.

Miramar Golf Course Yard

Given that the MGC Yard will mainly be used during the day, overnight lighting will be confined to headlights from light vehicles and security lighting fixed to temporary buildings. Where required between 6 am and 8 pm, lighting on mobile plant, and up to three portable lighting towers may be used to provide adequate lighting for yard operations.

Stage 1 korora colony

Lights have been recommended within the underpass and alongside the gravel paths to attract korora to the colony and nest sites (Korora Ornithology 2025).

Lighting Effects

Artificial light at night (ALAN) has been shown to have a significant negative effect on migratory seabirds in New Zealand by disorientating them and consequently increasing collisions with hundreds of recorded mortalities annually (Heswall et al, 2022). Species most susceptible to ALAN are fledglings within the order Procellariiformes, which includes shearwaters, petrels and albatrosses. Fledgling seabirds have been shown to be grounded in response to artificial light 15 km away, leading to injury and mortalities (Rodríguez et al, 2014).

Fluttering shearwaters breed on Matiu/ Somes Island (~10 km north of the proposed site), and numerous records of fluttering shearwaters can be found post breeding season within the Wellington Harbour (Figure 16), many of which will be fledglings most at risk to the effects of ALAN.

ALAN also has the potential to affect fauna on site and within distant ecosystems, disrupting behaviours, interactions between individuals and altering community assemblages (Longcore & Rich, 2004). Roosting shorebirds may be displaced from the artificially lit site to less preferable sites and be exposed to increased predation where lighting makes them more visible at night (Rodriguez et al, 2017).

Although WIAL currently operates lights at night to support unscheduled aircraft landings, the Project will introduce additional light to facilitate their works, increasing cumulative effects and potentially increasing the range of effects within the surrounding environment. Table 14 describes coastal avifauna species susceptible to ALAN recorded within a 15 km radius of the Project areas that may be negatively impacted by an increase in lighting without mitigation measures.

Figure 16. Fluttering shearwater records post breeding season in proximity to the proposed site. A breeding ground is recorded on Matiu / Somes Island within the Wellington Harbour.

Based on Table 12 of the EIANZ guidelines (EIANZ, 2018), and the Project's anticipated timeline, the effects at Moa Point are expected to be temporary and short term (up to 5 years). The effects at Miramar Golf Course are not expected to increase due to the baseline of lighting currently used and the hours of operation.

WIAL engaged a lighting expert (Leading Design Professionals, 2025) to investigate potential design changes to reduce the effects of ALAN, whilst adhering to health and safety measures on Site and practicalities such as supply, fixtures, alterations in machinery. This resulted in several sensitive luminary recommendations being implemented within the Project areas such as reducing the correlated colour temperature (CCT) to 3000k, using adaptive controls such as timers and motion sensors, and limiting the upward tilt of lights to reduce light spill. These lighting conditions, are recommended by the National Light Pollution Guidelines for Wildlife (NLPGW) (DCCEEW, 2023) to minimise potential adverse effects of ALAN

on seabirds. The lighting controls implemented for the Project (as per Leading Design Professionals, 2025) are described below:

> *1. Colour and colour temperature: Luminaires used for all fixed area lighting (mounted on buildings and columns) and luminaires used for mobile lighting towers, shall be white LED with a colour temperature of 3000K*
> *2. Intensity: The intensity of each luminaire shall be the practical minimum required to ensure safe conditions for construction*
> *3. Adaptive controls:*
>
> *a. Security lighting shall be fitted with daylight and motion sensor control*
> *b. All other fixed area lighting (mounted on buildings and columns) shall be fitted with daylight and time control to ensure that they only operate at night (i.e. dusk to dawn) and only during permitted construction activity times*
>
> *4. Temporary Building Security Lighting: Shall be mounted on buildings and shall be located and selected such that no light is emitted above the luminaire.*
> *5. Fixed area lighting: Shall be aimed away from any public road or residence located within 500m and the upward tilt of any floodlight shall not exceed 0 degrees. The total height shall not exceed 10m.*
> *6. Mobile lighting towers: Shall be aimed away from any public road or residence within 500m and the upward tilt of any floodlight shall not exceed 0 degrees. The total height shall not exceed 10m.*
> *7. Mobile plant and vehicle work lights (other than a crane boom light): Any work lights attached to vehicles or mobile plant (e.g. aimable lights attached to the plant or vehicle, other than vehicle headlights, tail lights, hazard warning lights and the like) shall be tilted up to no greater than 45 degrees if up to 3m above ground, or 30 degrees if higher.*
> *8. Headlight Sweep:*
>
> *a. Vehicle egress locations from the SSC shall not be established within 30m of 35-48 Moa Point Road*
> *b. Vehicles operating within any Work Site or travelling between the Work Sites shall not use un-dipped headlights.*

Temporary buildings will be present within the Project footprint which may reflect light at night if shiny, polished or light-coloured surfaces are used on the exterior of buildings. Such reflectivity can contribute to skyglow and potentially affect sensitive fauna within the surrounding environment if mitigation measures are not implemented (DCCEEW, 2023). The NLPGW recommends using non-reflective dark-coloured surfaces for buildings on site to minimise the reflectivity and skyglow from ALAN during the Project operation. As the Landscape, Natural Character and Visual Effects Assessment (Boffa Miskell, 2025b) specifies that all buildings within the Project areas will have the exteriors treated with the following protocols: "*The exterior treatment of all buildings shall use recessive colours of greys, browns and greens, with RV value no higher than 20%",* this potential effect on sensitive fauna within the landscape (specifically seabirds) is considered to be negligible and no further mitigation measures are required.

If these lighting conditions are followed for the duration of the Project, the potential effects towards seabirds would be minimised, and the magnitude of effect is therefore considered to be **low.**

5.1.4 Dust

The effects of dust generated from the Project, and vehicles could also affect the surrounding vegetation. Dust may smother fauna habitats (including foraging areas and retreat sites) small seedlings, ferns and epiphytes, impeding their growth and increasing mortality. Potential and known habitats at MGC and Moa Point Yards, and the seawall area are all edge environments subject to some dust impacts from an already highly modified environment, though this baseline is expected to increase with the anticipated Project areas.

It is recommended that the Ministry for the Environment's '*Good Practice Guide for Assessing and Managing Dust*' section 5.2 (Ministry for the Environment, 2016), is followed. If this mitigation measure is followed, the potential dust effects are considered to be **low** and no further mitigation measure is required.

5.2 Moa Point: Magnitude and Level of Effects

5.2.1 Vegetation

The Project will require the removal of 0.5 ha of low value coastal vegetation and habitat (and associated fauna habitats, assessed below) to facilitate the construction of Moa Point Yard (shown in Figure 9).

Some vegetation removal (exotic grasses and weed species only) will also be required at the Stage 1 kororā colony to facilitate construction of the perimeter fence (along the north, east and south edges where vegetation exists), and construction of the culvert opening (Figure 3). Hand clearance of exotic vegetation will be undertaken where necessary to facilitate placement of nest boxes and gravel paths throughout the stage 1 kororā colony area. The gravel paths will utilise where possible, unvegetated, grassy and/or weedy areas to avoid native vegetation removal and preserve fauna habitat on site. Of the vegetation proposed for removal, a high proportion consists of exotic and common native coastal vegetation, which is widespread throughout the Wellington Region and its coastline.

The Moa Point Yard vegetation is regenerating over a constructed hardfill at the western end of Moa Point Beach. Its removal would not result in any fragmentation of existing extent, and it does not provide any significant buffer to vegetation beyond the construction yard.

Following disestablishment of the construction yard, the reserve restoration area and the eastern bank remediation area (Figure 4) would be restored with indigenous plantings and rocks to stabilise the bank, and reduce the effects of coastal erosion, whilst also enhancing fauna habitat, with consideration to dotterel, kororā, skinks and geckos.

Within the kororā colony stage 1 area, native coastal plantings will be undertaken throughout the site, replacing weedy species with appropriate native, coastal plantings. Screen planting of *Phormium tenax* will be undertaken along the Moa Point Road fencing on the landward and seaward side (Figure 3), increasing the density of native vegetation on site, and providing additional fauna habitat.

1.2.1.4
If this approach is followed, the magnitude of effect on vegetation removal at Moa Point and within the kororā colony stage 1 is considered to be **low** and remediation with an indigenous-dominant community of plants, with consideration to provision of At-Risk plant species where practicable, could result in an overall positive magnitude. This results in an overall **very low – positive level of effect.**

5.2.2 Avifauna

A loss of roosting, foraging and breeding habitat for banded dotterel is expected as a result on the Moa Point Yard construction and operation. For other highly mobile species that are not breeding on site, the loss of this fragment as a resource would result in a loss of intermittent foraging area of low magnitude, given there are suitable habitat alternatives along the Wellington Coastline, of higher value.

5.2.2.1 Breeding banded dotterel

For banded dotterel, it is conservatively estimated that up to three pairs (but some seasons indicate one or two pairs at this location) may use the Moa Point project area for nesting and breeding, and therefore this habitat would become unavailable to them as a result of the project. Given the anticipated timeline for this Project, this potential displacement would involve at least seven breeding seasons (see Section 1.2.3 for the project timeline). The effect of this could potentially include loss of breeding opportunities (i.e. fledging failure) during this time, if those pairs cannot establish a breeding territory elsewhere.

Historic records indicate breeding occurs in low densities (average of 4 individuals on site (range 2-8) as per WIAL breeding season records Table 15) and suitable habitat is available within the adjacent Wellington Airport grassland which may be utilised by the potentially displaced banded dotterel (Figure 28). Banded dotterel lay nests between 25 m and 150 m apart from other pairs[34]. Using a conservative approach, the maximum breeding distribution distance between pairs (150 m) alongside the area of suitable habitat at the Airport, indicates that there would be available habitat for approximately twelve breeding pairs at the Airport (Figure 29). This represents more pairs than have been recorded over the 2022, 2023, and 2024 breeding seasons (maximum 8 birds / 4 pairs). This suggests that existing available (pest controlled) space at Wellington Airport would support potential displacement of three pairs from Moa Point Yard.

Both the Moa Point Yard (a highly modified environment built on reclaimed land) and Wellington Airport runway and taxiways, with anthropogenic disturbances, are likely to be sub-optimal habitat for banded dotterel breeding, which indicates both the resilience and adaptability of this species, and therefore that any displaced pairs would be expected to re-establish territories in similar adjacent environments, including those available habitats at Wellington Airport. For individuals displaced into Wellington Airport grassland, the surrounding anthropogenic (i.e., human activity, dogs) and environmental pressures (i.e., mammalian predators), would be reduced, as the perimeter is fenced and pest controlled by Pest Free Miramar and Wellington Airport. Banded dotterels have successfully bred and fledged chicks within the Wellington Airport grassland area, which indicates the site is capable of supporting a breeding population, and the magnitude of effect of displacement as a result of the Project would be **no more than low**.

Potentially displaced birds breeding within the grassland area of the airport may be at risk of bird-strike, especially young mobile chicks learning to fly, as shown by Ohakea Military Base airport which monitor breeding banded dotterel on site[35].

[34] Banded Dotterel

[35] https://www.nzdf.mil.nz/media-centre/news/ohakea-worker-goes-above-and-beyond-to-keep-fearless-dotterels-flying/

To mitigate any risk on breeding success, provisions of nest cages[36] and refuge huts for three pairs of breeding dotterel (one per clutch) should be provided. These provisions will provide refuge from aerial predators, and increase chick survival to fledging (Butcher et al, 2007).

Methods to avoid potential adverse effects on avifauna at Moa Point, including timing for establishment of the construction yard to avoid the breeding season, and methods to minimise disturbance for potentially breeding birds at the construction yard, are outlined within Section 6.3, and include mitigation measures (discussed above) such as:

- Nest checks during the breeding season;
- Nest exclusion zones within works areas;
- Implementing sensitive lighting designs; and
- Refuge huts and nest cages (Figure 19, Figure 20, Figure 21, Figure 23).

The detailed methodology for these measures is set out in the AMP.

Following disestablishment of the Moa Point Yard, the yard will be levelled and reinstated to the previous state, to provide nesting opportunities for breeding banded dotterel in future. As banded dotterel prefer sites with clear vantage to detect potential predators whilst nesting, the planting palette within the Rehabilitation Area – Landscape Plan (Boffa Miskell, 2025a) recommends low-growing coastal species (i.e., shrubs, ground covers (1m<)) adjacent to the reinstated Moa Point Yard, to maintain nesting habitat for banded dotterel. This area will be fenced to provide protection to banded dotterel from people and dogs, supporting breeding success and further improving the nesting habitat on site.
In consideration of the above, and if the AMP is followed, the magnitude of effect of construction and operation of Moa Point Yard (and other works at Moa Point) would be low, and subsequent level of effect for avifauna at Moa Point would be **low.**

5.2.2.2 Other avifauna species

The proposed works at the Stage 1 korora colony and Moa Point yard (including the corner of Stewart Duff Drive, and Eastern Bank/Reserve) will require vegetation removal of small shrubs and several 2-3m tall trees. This vegetation supports nesting opportunities for native avifauna and therefore, there is some potential for mortality or injury to native birds, and eggs and chicks during tree felling- if felling occurs during the breeding season and an active nest is present.

Therefore, any potential effect should be avoided through pre-works surveys to identify any nesting native birds, and provision of buffer zones to ensure that any nesting native birds can complete breeding prior to vegetation removal. The vegetation within the Moa Point Yard and korora colony stage 1 are small relative to the surrounding landscape and therefore the (unmitigated) magnitude of the loss of this resource is low, resulting in a very low-level effect.

Methods to avoid potential mortality, injury or disturbance to nesting avifauna at the Moa Point Yard prior to removal of vegetation are outlined within Section 6.3 and include mitigation measures such as nest

[36]https://blog.doc.govt.nz/2018/12/07/banded-dotterel-nesting-season-finding-the-near-unfindable/#:~:text=These%20are%20installed%20at%20every,out%20traps%20for%20larger%20predators.&text=Do%20the%20cages%20work?,a%20day%20in%20the%20office.

checks during the breeding season and nest exclusion zones within works areas. The detailed methodology for these measures is set out in the Avifauna Management Plan.

In consideration of the above, and if the Avifauna Management Plan is followed, the magnitude of effect would be **negligible**, and subsequent level of effect for avifauna at Moa Point would be **very low.**

5.2.3 Herpetofauna

Habitat Loss

Within the Moa Point Yard, there would be a temporary loss of herpetofauna habitat of approximately 1890 m^2 (0.18 ha) for the duration of the Project. The loss of this fragment as a resource is considered low given there are suitable habitat alternatives along the Wellington Coastline, of higher value, and are predator controlled by Pest Free Miramar Peninsula.

The anticipated timeframes for this project indicate that this loss would be temporary (approximately seven years) but after which the currently vegetated components of the Moa Point Yard (which is currently largely hardfill waste) would be restored, and improved with additional plantings and remediation of the eastern area, and it is expected that native lizards would recolonise these new environments as they mature.

Within the stage 1 and stage 2 korora colonies, approximately 160 korora nest boxes are proposed to be placed - where possible under or against shrubs, trees or rocks, with additional rocks and/or driftwood hand placed along the peripheries. These features are expected to provide habitat for lizards, and when integrated with existing vegetation (under the direction of an ecologist), will improve site connectivity. Gravel paths are also proposed throughout the colonies (limited to up to 300mm wide). These narrow paths are unlikely to fragment the lizard habitat on site as lizards are capable of moving between small clearings, provided dense vegetation for shelter and predator protection exists on the other side. Additionally, the paths will provide edges alongside the vegetation, which lizards (most likely skinks) will utilise for basking cryptically under cover. Additionally, these paths will concentrate human presence on site (for monitoring and maintenance purposes), reducing the likelihood of vegetation and habitat being trampled or disturbed. Additional plantings are proposed within the colonies, many of which are ground covers and shrubs selected to provide resource and refugia for native lizards, to improve the habitat values and mitigate any potential habitat loss.
In consideration of the above, the magnitude of loss is considered **negligible to low**.

Mortality during vegetation clearance

Low value grass skink and Raukawa gecko, and potentially other higher value native lizard species present at less than detectable levels, are present within small patches of vegetation that would be removed to construct and operate the Moa Point Construction Yard, and features within the stage 1 and stage 2 kororā colony areas (i.e., security fence and culvert). If unmanaged, the removal of this vegetation could place native lizards at the risk of injury or death.

To minimise mortality and injury to protected native lizards, measures to manage potential effects of proposed Project (i.e. vegetation clearance and earthworks) on lizards are set out in Section 6.2. The detailed methodology for these measures is set out in the Lizard Management Plan.
6.2

If the Lizard Management Plan is adhered to during the works phase, it is considered that the magnitude of effects of the proposed vegetation clearance to lizards would be **low**, resulting in an overall **Very Low** level of effect.

5.3 MGC Yard: Magnitude and Level of Effects

5.3.1 Vegetation

Predominantly managed lawn, amenity trees and rough grass at the proposed Miramar Golf Course Yard with an overall negligible botanic value, would be removed. This includes:

- Exotic mown grassland 3.7 ha (as well as a number of mature exotic and native tree species, i.e., pōhutukawa and pine trees);
- Exotic grassland habitat 0.57 ha; and
- Karo treeland and scrub 0.014 ha.

The extents of native vegetation removal is less than 1 ha which is a very-low proportion relative to the surrounding environment, and comprises predominantly exotic species, weedy species, or species not native to the Wellington Region (pōhutukawa and karo). The southern perimeter edge of the MGC Yard is proposed to be buffer planted with native shrubs, grasses and small trees (1-2m tall) (Figure 6), which will enhance the botanic values on site, provide additional vegetation buffering to the adjacent Tukanae Reserve, and mitigate any loss of native vegetation required to facilitate the construction of the MGC Yard.

This proportion of vegetation removal and edge planting at MGC Yard is therefore assessed as a **negligible to positive** magnitude of effect, resulting in a **very low to positive overall effect**.

5.3.2 Avifauna

The habitats for avifauna at the MGC yard are low value and are used predominantly by common native and exotic species on an intermittent basis, for foraging and roosting. Some native bird species (e.g. fantails, and grey warblers) have relatively small territories (~0.1 - 0.2 km; Innes et al., 2022), and therefore it is possible that some of the observed birds are resident within the fragment - particularly at the rough grass edges of the maintained lawns. Other native species such as tūī and kererū are more mobile and may utilise several forest fragments in the surrounding area. The vegetation generally lacks a diversity of fruiting and flowering food sources that a more diverse forest fragment would support and current proximity to the airport may further reduce the quality of these resources.

Direct effects on native birds as a result of vegetation removal for construction and operation of the MGC Yard would involve removal of large trees within the Golf Course and karo treeland that may be used for foraging and roosting. These areas are unlikely to be used for nesting, however there is some potential for mortality or injury to native birds during tree felling- if felling occurs during the breeding season and an active nest supports eggs or unfledged chicks. Similarly, low potential for nesting by TAR species at ground level, such as NZ pipit or falcon, would be a more significant direct effect due to the higher value of these species. Therefore, any potential effect should be avoided through pre-works surveys to identify any nesting native birds, and provision of buffer zones to ensure that any nesting native birds can complete breeding prior to vegetation removal.

Methods to avoid potential mortality, injury or disturbance to nesting avifauna at the MGC Yard prior to the construction and operation phases are outlined within Section 6.3 and include mitigation measures such as nest checks during the breeding season and nest exclusion zones within works areas. The detailed methodology for these measures is set out in the Avifauna Management Plan.

The vegetation within the MGC Yard is a relatively small area within the surrounding landscape and therefore the (unmitigated) magnitude of the loss of this resource is low, resulting in a very low-level effect. As the edge of the MGC Yard adjacent to the Tukanae Reserve is proposed to be planted with native trees and shrubs, additional habitat and resource will be provided for avifauna as the vegetation matures, with improved continuity within the landscape, resulting in a positive benefit to avifauna over time.

In consideration of the above, and if the Avifauna Management Plan is followed, the magnitude of effect would be **negligible**, and subsequent level of effect for avifauna at the MGC Yard would be **very low.**

5.3.3 Herpetofauna

Habitat Loss

Based on the current works extent, there would be a loss of herpetofauna habitat along the edge of the MGC Site, (~0.16 ha), which represents a very low proportion of low value vegetation, predominantly exotic grassland. [redacted] The magnitude of this habitat loss is considered **negligible**.

Mortality During Vegetation Clearance

Low value grass skink, potentially Raukawa gecko, and possibly other high value native lizard species present at less than detectable levels, are present within the rough grass edges that would be removed and landscaped with indigenous vegetation to construct and operate the MGC Yard. If unmanaged, the removal of this vegetation could place native lizards at the risk of injury or death.

6.2To minimise mortality and injury to protected native lizards, measures to manage potential effects of proposed Project (i.e. vegetation clearance and earthworks) on lizards are set out in Section 6.2. The detailed methodology for these measures is set out in the Lizard Management Plan.

If the Lizard Management Plan is adhered to during the works phase, it is considered that the magnitude of effects of the proposed vegetation clearance to lizards would be **low**, resulting in an overall **Very Low** level of effect.

5.3.4 Natural Inland wetland and Pond

Clause 3.22 of the NPS-FM seeks to avoid the loss of extent of, and protection of the values of, natural inland wetlands, with an exemption where:

- *The works are necessary for the construction or upgrade of specified infrastructure;*
- *There is a functional need for the specified infrastructure in that location; and*
- *Effects are managed through applying the effects management hierarchy.*

We understand the MGC Yard works fit within the definition of specified infrastructure under the NPS-FM, and therefore as the natural inland wetland is within 100m of the MGC Yard, an assessment is required under NES-F Regulation 45 *Construction of specified infrastructure*.

There will be no direct effect on the natural inland wetland, or within 10 m of the wetland, as the wetland is 45 m beyond the proposed MGC Yard boundary (Figure 17), and therefore Regulation 45 (1) and (2) do not apply.

The wetland is located in one of the many small depressions on the Miramar Golf Course and has no direct hydrological connection with the proposed MGC Yard, no watercourses connected to the wetland (i.e., intermittent stream, ephemeral stream), and the wetland is formed by anthropogenic inundation.

As there is no direct hydrological connection, the earthworks located 45 m away will not result in complete or partial drainage of the wetland; and there will be no diversion of water from the wetland or discharge of water to the wetland; therefore Regulations 45 (3), (4) and (5) do not apply.

The inland wetland is located approximately 45 m from the MGC Yard site. Earthworks at the MGC Yard are temporary to establish the proposed MGC Yard and considered to have a **negligible** magnitude of effect on the wetland.

Figure 17. Proposed works within 100m (45m) of the natural inland wetland at Miramar Golf Course.

5.4 Summary of Effects

The level of effects to habitats and species, with mitigation, ranges from **negligible to low** as shown in Table 6. The details of the key mitigation measures for avifauna and lizards are set out in the Avifauna Management Plan and Lizard Management Plan that have been prepared to support this application.

Table 6. Summary of values and effects pertaining to the proposed Project and the recommended management strategies to reduce the potential effects. The level of effect is calculated using the matrix presented in Appendix B.

	Habitat or species	Ecological value	Magnitude of effect with mitigation	Level of effect	Management Recommendation
Moa Point	**Vegetation**	Low	Low	Very Low (potentially positive)	Restoration of the Eastern Bank Remediation site and Reserve Restoration area
	Avifauna	High (banded dotterel) Low (other avifauna)	Low	Low	Precautions re nesting (detail to be set out in Avifauna management plan)
	Marine Avifauna	High	Low	Low	Implementation of recommended lighting controls
	Lizards	Moderate	Low	Very low	Salvage and relocation (details set out in Lizard management plan)
	Bats	Nil	Nil	Nil	Not present
	Invertebrate	Low	-	-	-
Miramar Golf Course	**Vegetation**	Negligible	Negligible	Very Low (potentially positive)	
	Avifauna	Low	Negligible	Very low	Precautions re nesting (detail to be set out in Avifauna management plan)
	Lizards	Low	Low	Very low	Salvage and relocation (details set out in Lizard management plan)
	Bats	Nil	Nil	Nil	Not present
	Invertebrates	Low	-	-	-
	Pond	Nil	Nil	Nil	-
	Inland Wetland	Low**	Low	Very Low	

6 MANAGEMENT RECOMMENDATIONS

As noted in the previous sections, a number of measures will be implemented to avoid and / or minimise terrestrial and freshwater ecology effects. These management recommendations are summarised below. With the recommended measures in place, no substantial residual effects are expected for terrestrial or freshwater ecology.

6.1.1 Avoid

- Avoid potential mortality or injury to nesting avifauna (e.g. mortality to eggs, chicks) through implementation of pre-construction surveying, establishment of construction yards pre-bird breeding, and as required, nest / chick protection and exclusion zones if necessary. The detailed methodology is set out in an avifauna management plan and key points described in Section 6.3;
- The Project design within the MGC Yard avoids *karo treeland and scrub* along the south-eastern boundary. As per the conditions of the Airport's existing designation, that habitat is instead designated as a landscape buffer zone, approximately 4.46 ha. The vegetation within the landscape buffer zone is a higher value food and habitat resource to birds, invertebrates and indigenous lizard species including some TAR species which may potentially nest here, such as New Zealand Falcon;
- The Project design avoids the natural inland wetland on the MGC site.

6.1.2 Minimise

- Vegetation loss is minimised at Moa Point by utilising the cleared embankment for the Moa Point Yard, and a cleared area of grassland on the corner of Stewart Duff Drive and Moa Point Road;
- Native vegetation removal at the Stage 1 colony will largely be avoided when installing nest boxes and foot-access paths;
- Stage 1 colony paths will be minimised to no wider than 300 mm;
- Adverse effects to lizards will be minimised through various measures, as detailed in the Lizard Management Plan (see Section 6.2) (Bioresearches, 2025b);
- Adverse effects to avifauna will be minimised through various measures as detailed in the Avifauna Management Plan (see Section 6.3) (Bioresearches, 2025c);
- Management of indirect lighting effects on coastal avifauna during construction through implementation of specified control measures (see section 5.1.3);
- Management of indirect noise effects on fauna by implementation of controls or practices which minimise noise (See section 5.1.2);
- Minimise dust effects by following the Ministry for the Environment's 'Good Practice Guide for Assessing and Managing Dust' section 5.1.4 (Ministry for the Environment, 2016);
- Restoration planting at Stage 1 Kororā Colony will minimise potential effects of installation and monitoring of nest boxes on existing flora and fauna values.

6.1.3 Remediate

- Restoration planting and habitat enhancement of the Eastern bank, Reserve Restoration Area and kororā colonies (stage 1 and 2) at Moa Point, and the southern edge of the MGC Yard, following a the rehabilitation concept plan (Boffa Miskell, 2025a).

6.2 Addressing Effects on Lizards

We have recommended measures to address potential effects on lizards, including:

- Lizard search / trapping / salvage; and
- Relocation of salvaged / captured lizards to release sites, and enhancement and monitoring of those sites.

6.2.1 Lizard search / trapping / salvage

To minimise adverse effects on any native lizards within the works footprint, pre-clearance systematic searches and trapping and machine-assisted destructive searches during vegetation clearance will be carried out.

These activities will 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). That means vegetation clearance will be limited to the October to April season.

6.2.2 Relocation to release sites

[redacted]

[redacted]

Supplementary pest control will be initiated at a release site where ≥ 20 native lizards are released at that location (e.g., 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 25 m spacing.

Pest control will be operational for the duration of the works, and for five years after completion of works and of restoration works.

Success monitoring (where ≥ 20 native lizards are released) and a 'works completion' outcome report will be prepared and provided to Wellington City Council.

The Department of Conservation's '*Key principles for lizard salvage and transfer in New Zealand*' guidelines require consideration of the following nine guidelines when selecting a receiving site (Table 7). These matters are addressed below, with reference to the EcIA and/or this LMP (as relevant), as set out in the table below.

Table 7. 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 the **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 the LMP** applies multi-tool approach using to DOC biodiversity toolbox methods, as well as during works and post works searches. 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 3 of the 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 the LMP** identifies monitoring methods and objectives.
8	Reporting is required to communicate outcomes of salvage operations and facilitate process improvements.	**Section 5 of the LMP**
9	Contingency actions are required when lizard salvage and transfer activities fail.	**Section 6 of the LMP**

6.2.3 Lizard Management Plan

The objectives of the LMP are to minimise adverse construction effects on native lizards, and to maintain or enhance the populations of each species of native lizard present on the site at which vegetation clearance is to occur, either on the same site or at an appropriate alternative site; and to ensure that the receiving habitat(s) will support viable native lizard populations for all species present pre-development. These objectives will be achieved by:

- Using current best practice to capture native lizards from vegetation in the footprint during vegetation clearance and relocation 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;
- Meeting requirements of the Wildlife Act 1953, Resource Management Act 1991 and Fast-track Approvals Act 2024.

The LMP provides methods for capture, including trapping and / or search effort, timing of implementation, an assessment of the release locations, any habitat enhancement required and monitoring methods. Key elements within the LMP include the following:

- Credentials and contact details of the ecologist/herpetologist who will implement the plan:
  - Anticipated to be Chris Wedding, M.Sc., 20+ years of herpetological experience;
- Timing of the implementation of the LMP:
  - Lizard salvage, survey and relocation will be undertaken during the North Island 'lizard salvage season' (October to April, inclusive)
- A description of methodology for survey, trapping and relocation of lizards rescued including but not limited to: salvage protocols, relocation protocols (including method used to identify suitable relocation site(s)), diurnal capture protocols, supervised habitat clearance/transfer protocols, artificial cover object protocols, and opportunistic relocation protocols. Specific protocols used for trapping salvage are:
  - Pre-clearance systematic searches, followed by:
  - Lizard trapping for a five-day period preceding vegetation removal, including:
    - A minimum of 80 trap locations at Moa Point using pitfall traps, and/or funnel traps;
    - A minimum of 80 trap locations at Miramar Golf Course using artificial cover objects, and/or pitfall traps, and/or funnel traps; followed by:
  - Machine assisted searches during vegetation clearance using a tooth raked bucket.
- A full description of the recommended relocation site(s) directly adjacent to habitats where lizards were salvaged (Figure 18);
  - [redacted]
  - [redacted]

- A description of the provision for additional refugia for the first lizard released and every five lizards thereafter, e.g. depositing salvaged logs, wood or debris for newly released native skinks that have been rescued, and cobble rock piles for translocated geckos;
- A post-vegetation systematic habitat clearance search for remaining lizards;
- A description for the trigger, management, and protocols for pest control, key features here to note are;
    - Pest control will be triggered where ≥ 20 native lizards are released at that location;
    - Pest control will aim to target mice and hedgehogs, as rats, and mustelids are targeted within the release areas already;
    - Pest control shall be operational for the duration of the works, and for five years after completion of works and of restoration works (6-8 years);
- Any weed management to ensure the relocation site is maintained as appropriate habitat; and
- Monitoring will be triggered if ≥ 20 native lizards are captured and relocated from a worksite. This will include methods such as but not limited to: baseline surveying within the Site; baseline surveys outside the Site to identify potential release sites for salvaged lizard populations and lizard monitoring sites; ongoing annual surveys to evaluate translocation success; pre and post – translocation surveys; and monitoring of effectiveness of pest control and/or any potential adverse effects on lizards associated with pest control;
- Lizard management/vegetation removal report will be triggered if ≥ 20 native lizards are captured and relocated from a worksite;
- If triggered, lizard management/vegetation removal reporting will occur annually for five years following remediation/rehabilitation, and monitoring protocols; and
- Contingency actions for unanticipated adverse effects on lizards resulting from the Project, i.e., if any individual(s) lizard species with an At Risk or Threatened status are found during the salvage operation, pest control targeting mice will be implemented within the release site. Further details of which are provided in the LMP.
- Opportunities to collaborate with Victoria University of Wellington research programmes will be explored, to maximise conservation benefits arising from this project.

6.3 Addressing Effects on Avifauna

We have recommended specific ‘breeding management’ measures to address potential effects on avifauna, including:

- Measures prior to construction to deter dotterel and variable oystercatcher breeding / nesting at the Project site;
- Pre-construction nest surveys, the establishment of buffer zones around any active nests, and measures to avoid impacts on any chicks found in work areas;
- Where active nests of ground-nesting species (particularly banded dotterels) are found within the Airport grassland area, nest cages or refuge huts will be established to improve survival prospects for chicks; and
- Monitoring and reporting requirements.

The objective of the Avifauna Management Plan is to avoid mortality, injury and minimise impacts on nesting native birds (excluding kororā, for which management recommendations are provided

separately). The Project has the potential to disturb nesting native birds utilising the affected vegetation and habitats within Moa Point and Miramar Golf Course. While highly mobile adult birds are able to avoid mortality and injury as a result of project works, active nests that support eggs or dependent chicks are at risk of injury or death during site establishment and vegetation removal activities.

This objective will be achieved by:

a. Using current best practice (or new advances identified during Project operation) to survey for breeding activity and monitoring of active nests during incubation, and chicks during their dependent stage prior to fledging (avoid and minimise mortality of wildlife protected by the Wildlife Act);
b. Setting out standard surveying and monitoring protocols that are to be followed; and
c. Meeting requirements of the Wildlife Act 1953, Resource Management Act 1991 and Fast-track Approvals Act 2024.

Key elements within the AMP include the following:

- Credentials and contact details of the ecologist/ornithologist who will implement the plan
    - Intended to be Michael Anderson, PhD. 23+ years of ornithological experience;
- Timing of the implementation of the AMP;
    - During the breeding seasons for terrestrial avifauna (September-February inclusive), shorebirds (July-January inclusive), and karearea (August to March inclusive).
- A summary of the affected habitats and species covered by the AMP;
    - Banded dotterel, variable oystercatchers, karearea, and all other native terrestrial species.
- Recommended bird breeding management actions and protocols to mitigate adverse effects. These include but are not limited to; pre-vegetation clearance nest checks within the bird breeding season for terrestrial species (September to February inclusive), pre-works checks within the shorebird breeding season for coastal species (July to January inclusive), avifauna survey and monitoring procedures, demarcation and management of nests (where required), protocols to deter coastal avifauna from nesting on site, pre-construction nest surveys, protocols for eggs detected on site including exclusion zones (50 m: dotterel; 20 m: terrestrial avifauna; and 15 m-100 m depending on the stage of chicks/hatchlings: karearea), protocols for chicks detected on site, site-specific management, ongoing monitoring, provision of chick refuge for shorebirds on site (where required);
- Implementation and construction methodology of nest cages and refuge huts to provide shelter and increase the chance of fledgling success, for three pairs of breeding dotterel within the airport grassland, described in Section 6.3;
- Monitoring protocols for banded dotterel found breeding within the Project area, including weekly monitoring using trail cameras and site visits by an approved person, as set out in the AMP; and
- Reporting protocols between client and project ecologist/ornithologist. A completion report will be provided by the Project Ornithologist to WIAL at the end of each breeding season. Reporting should include information about the activities undertaken for monitoring of birds and present on site, as well as the outcome for any nests/chicks that are found to be present. This information can inform subsequent bird-breeding seasons to reduce impacts on breeding birds in the subsequent years of construction.

Further detail regarding the protocols and procedures set out in the AMP, as described briefly above can be found within the sections described in Table 8.

Table 8. AMP protocols and procedures, and relevant sections for referral

AMP protocols and procedures	Relevant section of AMP
Avifauna Management Plan	
Timing of the implementation of the AMP	
Summary of affected habitats and species	Section 2
Pre-work survey for the presence of birds and breeding status/nest presence.	Section 4.2 **Error! Reference source not found.**
Protocols to deter coastal avifauna from nesting on the site	Section 4.1
Protocols for eggs detected on-site	Section 4.3
Protocols for chicks detected on site	Section 4.4
Ongoing monitoring	Section 6
Demarcating active nests with a 50 -metre boundary (e.g. tape and posts) and a 50 metre no go zone.	Section 4.3
Daily checks for chick locations once chicks mobile	Section 4.4
Completion report	Section 6
Works nest management (NZ Falcon / kārearea)	
Demarcating active nests with a 100 -metre boundary (e.g. tape and posts) and a 100 metre no go zone. Exceptions can be made in certain circumstances as described AMP	Section 5.1.1
Completion report	Section 6

6.3.1.1 Nest Cages

Should active nests of ground nesting species (e.g., banded dotterels) be located within the airport grassland area, additional provisions are recommended. These will improve the survival chances for active nests and chicks. Three pairs of banded dotterel, that have successfully laid a nest within the airport grassland area should be provided with one nest cage per pair. Nest cages should be constructed with aims to protect eggs and incubating birds from any large predators (cats, gulls, harriers) with the following materials and methods (shown in Figure 19 and Figure 20):

- 664 Rebar 150 mm squares with wire bisecting each square to reduce likelihood of large predators entering;
- 15 mm wire netting on top to protect from predators entering the top of the cage;
- Installed within the airport grassland;
- The cage is put over the nest, pushing the bottom rebar into the ground for stability;
- One nest cage should be provided for per pair, for three pairs of dotterel that have successfully laid nests on the airport grassland;
- The cage should be constructed based on guidelines however it can be adapted where necessary to improve the design, ensure the cage does not pose Foreign Object Debris (FOD) risk to the Airport, and prevent predators from entering the cage, whilst still allowing space for dotterel to enter/exit;
- Nest cages should be installed within 48 hours of the nest (containing at least one egg) being discovered.

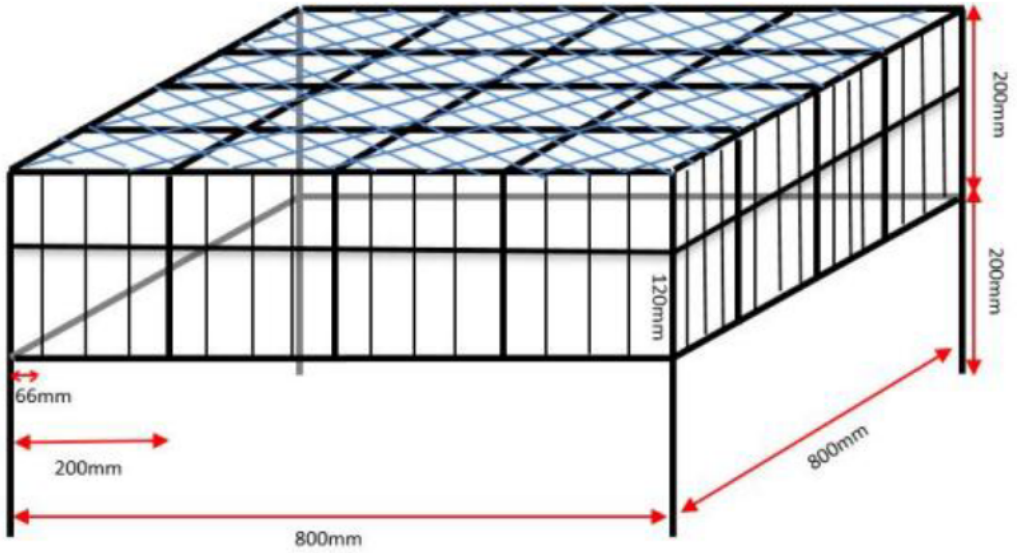

Figure 19. Recommended dotterel nest cage construction.

Figure 20. Nest cage construction example, photo from https://www.braidedrivers.org

Figure 21. Banded dotterel nesting within a nest cage.

6.3.2 Refuge Huts

If chicks hatch successfully within the airport grassland area (Figure 22), three clutches of banded dotterel chicks should be provided with a refuge hut (Figure 23), one per clutch. Refuge huts for chicks will provide shade and refuge increasing the survival chances of avifauna chicks (Butcher et al, 2007). These should be constructed and implemented using the following methodology:

- Wood (i.e., plywood), measuring >30cm x 30cm, with an internal brace supporting the connecting panels;
- Huts should be installed using an appropriate measure preventing the hut from moving from intended placement (i.e., tying to a pole, staking to the ground);
- One hut should be provided per successful clutch, for three breeding banded dotterel, installed at the time of hatching, and provided for the duration of the dotterel chicks presence on site;
- Huts should be installed within the airport grassland, within 48 hours of chicks hatching, and provided for three clutches;
- Huts should remain on site until the chicks have successfully fledged, or have not been detected on Site for over one week; and

The refuge hut design can be adapted where necessary to ensure the cage does not pose FOD risk to the Airport.

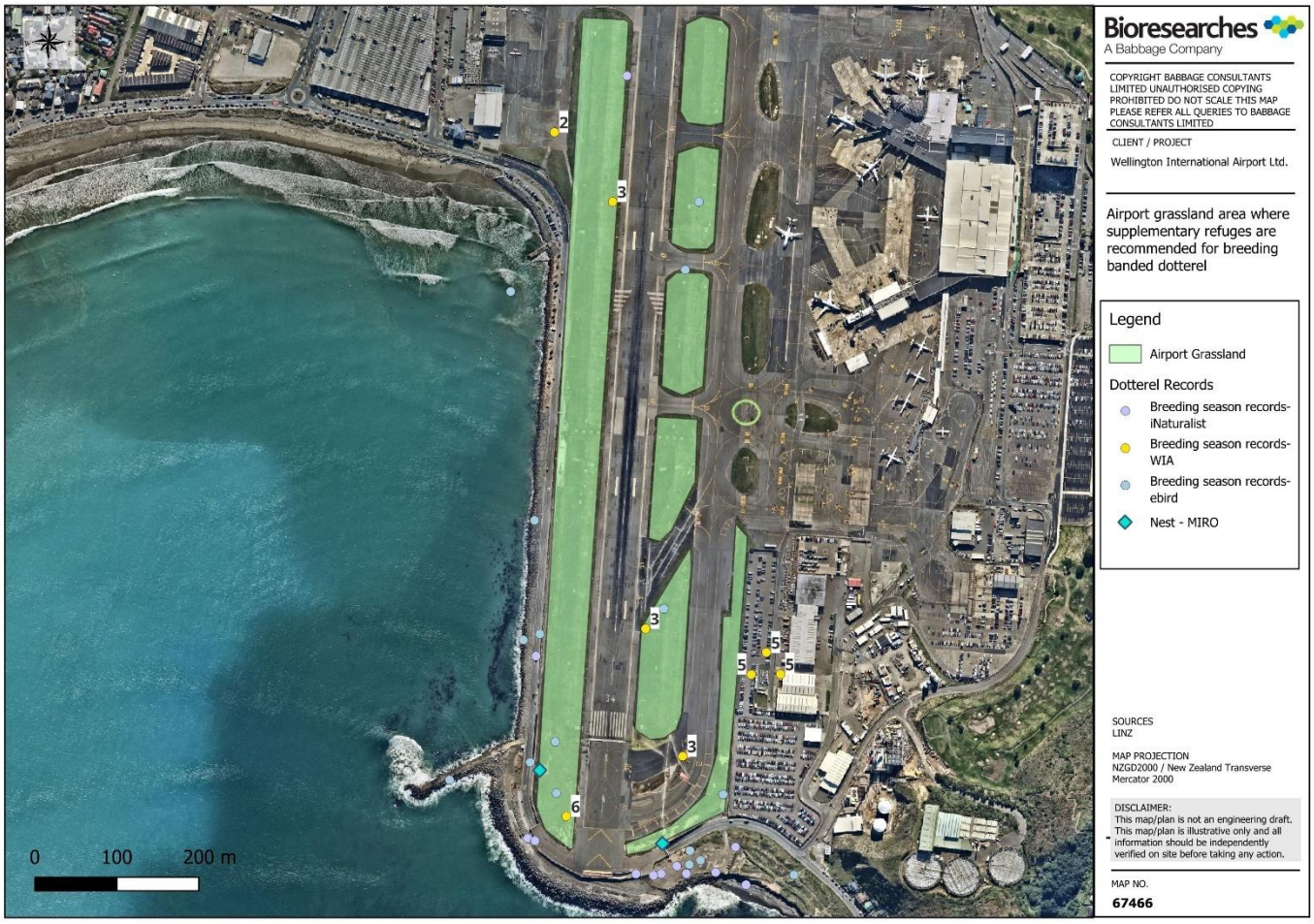

Figure 22. Airport grassland where refuge huts and cages may be provided for banded dotterel

Figure 23. Chick refuge huts (wooden tepees) to provide a refuge for chicks and protection from aerial predation (Photo from https://www.Birdlifeaustralia).

Full details, including cage design, installation, timing and quantities are provided in the Avifauna Management Plan (Bioresearches, 2025c).

6.4 Management of Indirect Effects

A summary of the indirect effects management recommendations for both Moa Point and the MGC Yard is provided below:

Noise and vibration
Implementation of noise management during works, and exclusion areas for nesting avifauna within the Project Areas, as discussed in Section 5.1.2.

Artificial light at night (ALAN)
Implementation of sensitive luminaries within the Project areas, as discussed in Section 5.1.3.

Dust
Adhering to recommendations within the Ministry for the Environments 'Good Practice Guide for Assessing and Managing Dust' section 5.2 (Ministry for the Environment, 2016), as discussed in Section 5.1.4.

7 WILDLIFE ACT

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.

[redacted]

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.

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, Table 14 of this report.

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[37], and 'Key principles for lizard salvage and transfer in New Zealand'[38], 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.

[37] 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.
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Appendix A National Policy Statement for Indigenous Biodiversity (NPS-IB)

The National Policy Statement for Indigenous Biodiversity (New Zealand Government, 2023) requires that identified adverse effects within SNAs are avoided, except where provided for under Clause 3.11, which identifies significant national or regional benefit that cannot otherwise be achieved using resources within New Zealand (NPS-IB, 3.11(1(aiii))). An explanation of the Project proposal with respect to this exception is provided with the application, however where adverse effects are managed pursuant to subclause 3, the following is required to be demonstrated:

1. How each step of the effect's management hierarchy will be applied
2. If biodiversity offsetting or biodiversity compensation is applied, how the proposal has complied with principles 1 to 6 in Appendix 3 and 4 and has had regard to the remaining principles in Appendix 3 and 4, as appropriate.

Effects Management Hierarchy

The effects management hierarchy is an approach to managing the adverse effects of an activity on indigenous biodiversity that requires that:

a. adverse effects are avoided where practicable; then
b. where adverse effects cannot be avoided, they are minimised where practicable; then
c. where adverse effects cannot be minimised, they are remedied where practicable; then
d. where more than minor residual adverse effects cannot be avoided, minimised, or remedied, biodiversity offsetting is provided where possible; then
e. where biodiversity offsetting of more than minor residual adverse effects is not possible, biodiversity compensation is provided; then
f. if biodiversity compensation is not appropriate, the activity itself is avoided

Appendix B Ecological Impact Assessment Methodology

The assessments were undertaken in general accordance with Ecological Impact Assessment guidelines, published by the Environment Institute of Australia and New Zealand (EIANZ; Roper-Lindsay *et al*. 2018). The Guidelines provide criteria for assigning value to habitat for assessment purposes. Values are assigned (High, Moderate, Low, Very Low, Table 9) based on the following four assessment matters (as described in Roper Lyndsay et al. 2018):

1. Representativeness
2. Rarity / Distinctiveness
3. Diversity / Pattern
4. Ecological Context

Attributes for freshwater sites are described in Table 11. The level of effect is then determined by determining the magnitude (Table 12) and combining the value of the ecological feature/attribute with the score or rating for magnitude of effect to create a criterion for describing the level of effects (Table 13).

Cells with low or very low levels of effect represent low risk to ecological values rather than low ecological values *per se*. A moderate level of effect requires careful assessment and analysis of the individual case. For moderate levels of effects or above, measures are expected to be introduced to avoid through design, or appropriate mitigation needs to be addressed (Roper-Lindsay *et al*. 2018).

Table 9. Criteria for assigning value to habitat/species for assessment.

Value	Determining Factors
Very High	Species value: Nationally Threatened species found in the 'zone of influence' (ZOI) either permanently or seasonally. Habitat Value: Area rates 'High' for at least three of the assessment matters of Representativeness, Rarity/distinctiveness, Diversity and Pattern, and Ecological Context. Likely to be nationally important and recognised as such.
High	Species value: listed as At Risk – Declining found in the ZOI either permanently or seasonally. Habitat Value: Area rates 'High' for two of the assessment matters, and 'Moderate' and 'Low' for the remainder OR area rates 'High' for one of the assessment matters and 'Moderate' for the remainder. Likely to be regionally significant and recognised as such.
Moderate	Species value: Species listed as At Risk – Relict, Naturally Uncommon, Recovering found in the ZOI either permanently or seasonally. Habitat Value: Locally uncommon or distinctive species. Area rates 'High' for one of the assessment matters, 'Moderate' or 'Low' for the remainder OR area rates as 'Moderate' for at least two of the assessment matters and 'Low' or 'Very Low' for the remainder. Likely to be important at the level of the Ecological District.
Low	Species value: Nationally and locally common indigenous species.

	Habitat Value: Area rates 'Low' or 'Very Low' for majority of assessment matters, and 'Moderate' for one. Limited ecological value other than as local habitat for tolerant native species.
Negligible	Species value: Exotic species including pests, species having recreational value. Habitat Value: Area rates 'Very Low' for three assessment matters and 'Moderate', 'Low' or 'Very Low' for the remainder.

Table 10. Attributes to be considered when assigning ecological value or importance to a site or area of terrestrial vegetation / habitat / community (as per Table 4 of Roper-Lindsay et al. 2018).

Matters	Attributes to be considered
Representativeness	• Criteria for representative vegetation: • Typical structure and composition • Indigenous species dominate • Expected species and tiers are present • Criteria for representative vegetation: • Species assemblages that are typical of the habitat • Indigenous species that occur in most of the guilds expected for the habitat type
Rarity/Distinctiveness	• Criteria for rare/distinctive vegetation and habitats: • Naturally uncommon or induced scarcity • Amount of habitat or vegetation remaining • Distinctive ecological features • National Priority for Protection • Criteria for rare/distinctive species of species assemblages: • Habitat supporting nationally threatened or At-Risk species, or locally uncommon species • Regional or national distribution limits of species or communities • Unusual species or assemblages • Endemism
Diversity and pattern	• Level of natural diversity, abundance and distribution • Biodiversity reflecting underlying diversity • Biogeographical considerations- pattern, complexity • Temporal considerations, considerations of lifecycles, daily or seasonal cycles of habitat availability and utilisation
Ecological context	• Site history and local environment conditions which have influenced the development of habitats and communities • The essential characteristics that determine an ecosystems integrity, form, functioning and resilience (from 'intrinsic value' as defined in RMA) • Size, shape and buffering • Condition and sensitivity to change • Contribution of the site to ecological networks, linkages, pathways and the protection and exchange of genetic material • Species role in ecosystem functioning - high level, key species identification, habitat as proxy

Table 11. Matters that may be considered when assigning ecological value to a freshwater site or area (as per Table 7 of Roper-Lindsay et al. 2018).

Matters	Attributes to be considered
Representativeness	• Extent to which site/catchment is typical or characteristic • Stream order • Permanent, intermittent or ephemeral waterway • Catchment size • Standing water characteristics •
Rarity/ Distinctiveness	• Supporting nationally or locally Threatened, At Risk or uncommon species • National distribution limits • Endemism • Distinctive ecological features • Type of lake/pond/wetland/spring
Diversity and pattern	• Level of natural diversity • Diversity metrics • Complexity of community • Biogeographical considerations - pattern, complexity, size, shape
Ecological context	• Stream order • Instream habitat • Riparian habitat • Local environmental conditions and influences, site history and development • Intactness, health and resilience of populations and communities • Contribution to ecological networks, linkages, pathways • Role in ecosystem functioning – high level, proxies

Determining Magnitude and Level of Effects

Criteria for describing the magnitude of effects are described as per Table 12. The level of effect can then be determined through combining the value of the ecological feature/attribute with the score (Table 13) or rating for magnitude of effect to create a criterion for describing the level of effect. The cells in bold italics represent a 'significant' effect. Cells with low or very low levels of effect represent low risk to ecological values rather than low ecological values *per se*. A moderate level of effect requires careful assessment and analysis of the individual case. For moderate levels of effects or above, measures need to be introduced through design, or appropriate mitigation (EIANZ 2018).

Table 12. Criteria for describing the magnitude of effects (EIANZ 2018)

Magnitude	Description
Very High	Total loss of, or a very major alteration to, key elements/features of the existing baseline conditions, such that the post-development character, composition and/or attributes will be fundamentally changed and may be lost from the Site altogether; AND/OR Loss of a very high proportion of the known population or range of the element/feature.
High	Major loss of major alteration to key elements/features of the existing baseline conditions such that the post-development character, composition and/or attributes will be fundamentally changed; AND/OR Loss of a high proportion of the known population or range of the element/feature.
Moderate	Loss or alteration to one or more key elements/features of the existing baseline conditions, such that the post-development character, composition and/or attributes will be partially changed; AND/OR Loss of a moderate proportion of the known population or range of the element/feature.
Low	Minor shift away from existing baseline conditions. Change arising from the loss/alteration will be discernible, but underlying character, composition and/or attributes of the existing baseline condition will be similar to pre-development circumstances and patterns; AND/OR Having minor effect on the known population or range of the element/feature.
Negligible	Very slight change from the existing baseline condition. Change barely distinguishable, approximating to the 'no change' situation; AND/OR Having negligible effect on the known population or range of the element/feature.

Table 13. Criteria for describing the level of effects (EIANZ 2018). Where text is italicised, it indicates 'significant effects' where mitigation is required.

Magnitude of Effect	Ecological Value				
	Very High	High	Moderate	Low	Negligible
Very High	*Very High*	*Very High*	*High*	*Moderate*	Low
High	*Very High*	*Very High*	*Moderate*	Low	Very Low
Moderate	*High*	*High*	*Moderate*	Low	Very Low
Low	*Moderate*	Low	Low	Very Low	Very Low
Negligible	Low	Very Low	Very Low	Very Low	Very Low
Positive	Net Gain	Net Gain	Net Gain	Net Gain	Net Gain

Appendix C Taxa records on-site

Table 14. Coastal avifauna identified from desktop and field observations. National threat status= Robertson et al (2021), Regional threat status= Crisp et (2023); Field assessments: Burgin, D., and Ray, S (2020); RMA Ecology (2023); Thompson, D. (2021); Bioresearches (2024-2025),

Common Name	Scientific Name	Specified Highly Mobile Fauna (NPS-IB)	National Threat Status	Regional Threat Status	Marine specific	Recorded during field surveys	Potential to occur at MP	Potential to occur at MGC	Comments
Banded Dotterel	*Charadrius bicinctus*	?	At Risk - Declining	Threatened endangered		MP	?	?	Breeding site nearby (southern runway). Potential roosting site on the Golf Course
Bellbird	*Anthornis melnura*		Not Threatened	Not Threatened				?	May be present feeding and/or nesting within trees.
Antipodean Albatross	*Diomadea antipodensis*		Threatened critical	Migrant	?		?		Recorded in the Cook Strait
Australasian Gannet	*Morus serrator*		Not Threatened	Migrant	?				Unlikely to be found on site due to marine habitat specificities.
Bar-tailed Godwit	*Limosa lapponica*		At Risk - Declining	Threatened critical			?		Migrant - records of roosting at Lyall Bay
Black backed gull	*Larus dominicanus*		Not Threatened	Not Threatened			?	?	Roosting only, ubiquitous along coastline.
Black Shag	*Phalacrocorax carbo*		At Risk - Relict	Threatened critical			?	?	Foraging/roosting only, ubiquitous along coastline. Not key habitat, potential visitor to the site.
Black-billed Gull	*Chroicocephalus bulleri*	?	At Risk - Declining	Threatened critical		MP, MGC	?	?	Foraging/roosting only, ubiquitous along coastline. May use mown grassland for roosting.
Black-browed Albatross	*Thalassarche melanophris*		Vagrant	Vagrant	?		?		Records in Cook Strait, unlikely to be found on site.
Black-fronted Tern	*Chlidonias albostriatus*		Threatened – Endangered	Threatened - Endangered			?	?	Roosting only. Uncommon along the coastline.
Brown Skua	*Catharacta antarctica*		Threatened vulnerable	Migrant	?		?		Recorded in the Cook Strait
Buller's Albatross	*Thalassarche bulleri*		At Risk - Declining	Migrant	?		?		Recorded in the Cook Strait
Buller's Shearwater	*Ardenna bulleri*		At Risk - Declining	Migrant	?		?		Nocturnally active at breeding grounds
Cape Petrel	*Daption capense*		Migrant	Migrant	?		?		Numerous records within the cook strait
Caspian tern	*Hydroprogne caspia*	?	Threatened critical	Threatened vulnerable			?	?	Roosting only, numerous records along coastline. May use mown grassland for roosting at MGC.
Common Tern	*Sterna hirundo*		Vagrant	Vagrant			?		Roosting only, uncommon along coastline.
Cook's Petrel	*Pterodroma cookii*		At Risk - Relict	Vagrant	?		?		Several records throughout the Cook Strait. Unlikely to be found on site.
Fairy Prion	*Pachyptila turtur*		Threatened critical	At Risk – Relict	?		?		Several records throughout the Cook Strait. Unlikely to be found on site.
Fantail	*Rhipidura Fulginosa*		Not threatened	Not Threatened	?	MGC		?	Potential occasional foraging at vegetated edges.

Fluttering shearwater	*Puffinus gavia*		Threatened critical	At Risk - Relict	☑				Several records throughout the Cook Strait. Breeding colony on Matiu Island
Gray-backed Storm-Petrel	*Garrodia nereis*		At Risk - Relict	Migrant	☑				Recorded in the Cook Strait
Gray-faced Petrel	*Pterodroma gouldi*		Migrant	Not Threatened	☑				Several records throughout the Cook Strait. Unlikely to be found on site.
Grey warbler	*Gerygone igata*		Not threatened	Not Threatened	☑	MGC		☑	Potential occasional foraging at vegetated edges.
Hutton's Shearwater	*Puffinus huttoni*		Threatened vulnerable	Threatened vulnerable	☑				Several records throughout the Cook Strait. Unlikely to be found on site.
Kākā	*Nestor meridionalis septentrionalis*	☑	At Risk - Recovering	Threatened - Recovering				☑	Not key habitat, potential visitor to the site.
Kākāriki, red crowned parakeet	*Cyanoramphus novaezelandiae*		At Risk - Relict	Threatened - Recovering				☑	Not key habitat, potential visitor to the site.
Kārearea, NZ Falcon	*Falco novaeseelandiae*	☑	At Risk - Recovering	Threatened - Critical		MGC		☑	Potential to breed within rank grassland on the upper embankment.
Kererū	*Hemiphaga novaeseelandiae*		Not threatened	Threatened - Recovering				☑	May use the native forest within the buffer area for feeding.
Kingfisher	*Todiramphus sanctus*		Not threatened	Not Threatened		MGC		☑	May be present feeding and/or nesting within trees.
Korora	*Eudyptula minor*		At Risk - Declining	Threatened - Vulnerable		MP	☑		May be found at Moa Point breeding.
Light-mantled Albatross	*Phoebetria palpebrata*		Threatened vulnerable	Threatened vulnerable	☑				One live observation east of Breaker Bay (eBird).
Little Black Shag	*Phalacrocorax sulcirostris*		At Risk - Naturally Uncommon	Threatened vulnerable				☑	Foraging/roosting only, ubiquitous along coastline.
Little Shag	*Microcarbo melanoleucos*		At Risk - Relict	Threatened endangered		MP	☑	☑	Foraging/roosting only, ubiquitous along coastline.
Little Shearwater	*Puffinus assimilis*		At Risk - Recovering	Migrant	☑				Several records throughout the Cook Strait
New Zealand Pipit	*Anthus novaeseelandiae*	☑	At Risk - Declining	Threatened - Vulnerable			☑	☑	Several records in Lyall Bay, may use Moa Point for foraging/breeding.Potential to breed within rank grassland on the upper embankment.
Northern Giant-Petrel	*Macronectes halli*		At Risk - Recovering	Migrant	☑				Several records throughout the Cook Strait
Northern Royal Albatross	*Diomedea sanfordi*		Threatened vulnerable	Threatened vulnerable	☑				Several records throughout the Cook Strait. Unlikely to be found on site.
Paradise Duck	*Tadorna variegata*		Not Threatened	Not Threatened		MGC		☑	Potential breeding, foraging and roosting site on the Golf course
Parasitic Jaeger	*Stercorarius parasiticus*		Migrant	Migrant	☑				Migrant - unlikely to be found on site.
Pied Shag	*Phalacrocorax varius*	☑	At Risk - Recovering	Threatened vulnerable			☑	☑	Foraging/roosting only, ubiquitous along coastline.

Pied Stilt	*Himantopus himantopus*		Not Threatened	Not Threatened		MGC	?	?	May use site for roosting/feeding.
Pomarine Jaeger	*Stercorarius pomarinus*		Migrant	Migrant					Recorded in the Cook Strait.
Pukeko	*Porphyrio melanotus*		Not Threatened	Not Threatened		MGC		?	May use rank grassland areas on site for foraging and breeding.
Red Knot	*Calidris canutus rogersi*		At Risk - Declining	Vagrant			?		Several records within the area, may use Moa Point for roosting.
Red-billed Gull	*Chroicocephalus novaehollandiae*	?	At Risk - Declining	Threatened vulnerable		MP	?	?	Foraging/roosting only, ubiquitous along coastline.
Reef heron	*Egretta sacra*	?	Threatened – Endangered	Threatened critical		MP	?	?	Not key habitat, potential occasional foraging. Numerous records along coastline.
Ruddy Turnstone	*Arenaria interpres*		Vagrant	Migrant			?		Several records within the area, may use Moa Point for roosting.
Ruru	*Ninox novaeseelandiae*	?	Not Threatened	Not Threatened				?	May be present feeding and/or nesting within trees.
Salvin's Albatross	*Thalassarche salvini*		Threatened critical	Threatened critical	?				Recorded in the Cook Strait. Unlikely to be found on site.
Silvereye	*Zosterops lateralis*		Not threatened	Not Threatened		MGC		?	May be present feeding and/or nesting within trees.
Short-tailed Shearwater	*Ardenna tenuirostris*		Migrant	Migrant	?				Several records throughout the Cook Strait.
Snowy Albatross	*Diomedea exulans*		Migrant	Migrant	?				Recorded in the Cook Strait. Unlikely to be found on site.
Sooty Shearwater	*Ardenna grisea*		At Risk - Declining	Threatened critical	?				Several records throughout the Cook Strait and Wellington Harbour.
Southern Fulmar	*Fulmarus glacialoides*		Migrant	Migrant	?				Several records throughout the Cook Strait.
Southern Giant-Petrel	*Macronectes giganteus*		Migrant	Migrant	?				Several records throughout the Cook Strait.
Southern Royal Albatross	*Diomedea epomophora*		Threatened vulnerable	Threatened vulnerable	?				Recorded in the Cook Strait.
Spotted Shag	*Stictocarbo punctatus*		Threatened vulnerable	Threatened endangered			?	?	Foraging/roosting only, ubiquitous along coastline.
Tui	*Prosthemadera novaeseelandiae*		Not threatened	Not Threatened		MGC		?	May be present feeding and/or nesting within trees.
Variable Oystercatcher	*Haematopus unicolor*	?	At Risk - Recovering	Threatened endangered		MP	?	?	Foraging/roosting/breeding, ubiquitous along coastline.
Welcome Swallow	*Hirundo neoxena*		Not Threatened	Not Threatened		MGC		?	May be present feeding and/or nesting within trees.
Westland Petrel	*Procellaria westlandica*		At Risk - Naturally Uncommon	Migrant	?				Several records throughout the Cook Strait.
White Faced Heron	*Egretta novaehollandiae*		Not Threatened	Not Threatened		MP, MGC		?	Foraging/roosting only, ubiquitous along coastline.
White-fronted Tern	*Sterna striata*	?	At Risk - Declining	Threatened endangered			?	?	Roosting only, ubiquitous along coastline.

White-capped Albatross	*Thalassarche cauta*		At Risk - Declining	Migrant					Recorded in the Cook Strait.
Whitehead	*Mohua albicilla*		Not Threatened	Not Threatened		MGC			May be present feeding and/or nesting within trees.
Wrybill	*Anarhynchus frontalis*		Threatened – Increasing	Threatened critical					Lyall bay used as a seasonal migratory stopover.

Table 15. Banded Dotterel records at WIA during the breeding season. See Figure 24 for grid square map reference.

Breeding season records							
Inspection Date	**Year**	**Month**	**Runway in Use**	**Reason**	**Grid**	**Species**	**Counted**
01/07/2022	2022	July	16	Routine	WF08	Banded Dotterel	8
19/07/2022	2022	July	34	Routine	WD20	Banded Dotterel	2
27/07/2022	2022	July	16	Routine	WF28	Banded Dotterel	3
04/08/2022	2022	August	34	Routine	WF15	Banded Dotterel	2
13/09/2023	2023	September	34	Routine	WE31	Banded Dotterel	6
17/10/2023	2023	October	34	Routine	WE20	Banded Dotterel	3
02/11/2023	2023	November	34	Routine	WH28	Banded Dotterel	5
02/11/2023	2023	November	34	Routine	WH28	Banded Dotterel	5
03/11/2023	2023	November	34	Routine	WH28	Banded Dotterel	5
09/12/2023	2023	December	34	Routine	WG30	Banded Dotterel	3
31/08/2024	2024	August		Routine		Banded dotterel	3
Non breeding season records							
Inspection Date	**Year**	**Month**	**Runway in Use**	**Reason**	**Grid**	**Species**	**Counted**
30/06/2023	2023	June	34	Routine	WC16	Banded Dotterel	11
09/04/2023	2023	April	34	Routine	WD16	Banded Dotterel	10
17/03/2024	2024	March	34	Routine	WD18	Banded Dotterel	15
07/05/2023	2023	May	34	Requested by ATC	WD18	Banded Dotterel	12
12/03/2024	2024	March	34	Routine	WE15	Banded Dotterel	10
17/05/2023	2023	May	34	Routine	WE18	Banded Dotterel	15
07/04/2023	2023	April	16	Routine	WE19	Banded Dotterel	20
23/04/2023	2023	April	34	Requested by ATC	WE20	Banded Dotterel	8
05/03/2024	2024	March	34	Routine	WE30	Banded Dotterel	2
27/02/2024	2024	February	34	Routine	WE31	Banded Dotterel	30
18/01/2023	2023	January	16	Routine	WF28	Banded Dotterel	3
10/06/2022	2022	June	34	Requested by ATC	WF13	Banded Dotterel	0
10/01/2024	2024	January	16	Routine	WF30	Banded Dotterel	3
11/01/2024	2024	January	34	Routine	WF30	Banded Dotterel	5

06/01/2024	2024	January	16	Routine	WG30	Banded Dotterel	2
23/06/2022	2022	June	34	Routine	WF30	Banded Dotterel	3
25/02/2023	2023	February	16	Routine	WF30	Banded Dotterel	8
28/02/2023	2023	February	16	Routine	WF30	Banded Dotterel	5
20/01/2024	2024	January	34	Routine	WG30	Banded Dotterel	5
06/06/2022	2022	June	34	Requested by ATC	WF31	Banded Dotterel	40
06/06/2022	2022	June	34	Requested by ATC	WF31	Banded Dotterel	30
06/03/2024	2024	March	16	Routine	WF32	Banded Dotterel	5
24/06/2022	2022	June	34	Requested by ATC	WG28	Banded Dotterel	4
05/03/2024	2024	March	34	Routine	WG31	Banded Dotterel	12
25/02/2024	2024	February	16	Routine	WG31	Banded Dotterel	4
15/05/2024	2024	May		Routine		Banded dotterel	14
15/05/2024	2024	May		Routine		Banded dotterel	14
16/05/2024	2024	May		Routine		Banded dotterel	10
16/05/2024	2024	May		Routine		Banded dotterel	10
16/05/2024	2024	May		Routine		Banded dotterel	20
27/05/2024	2024	May		Routine		Banded dotterel	10
16/06/2024	2024	June		Routine		Banded dotterel	20
27/06/2024	2024	June		Routine		Banded dotterel	15
29/06/2024	2024	June		Routine		Banded dotterel	7

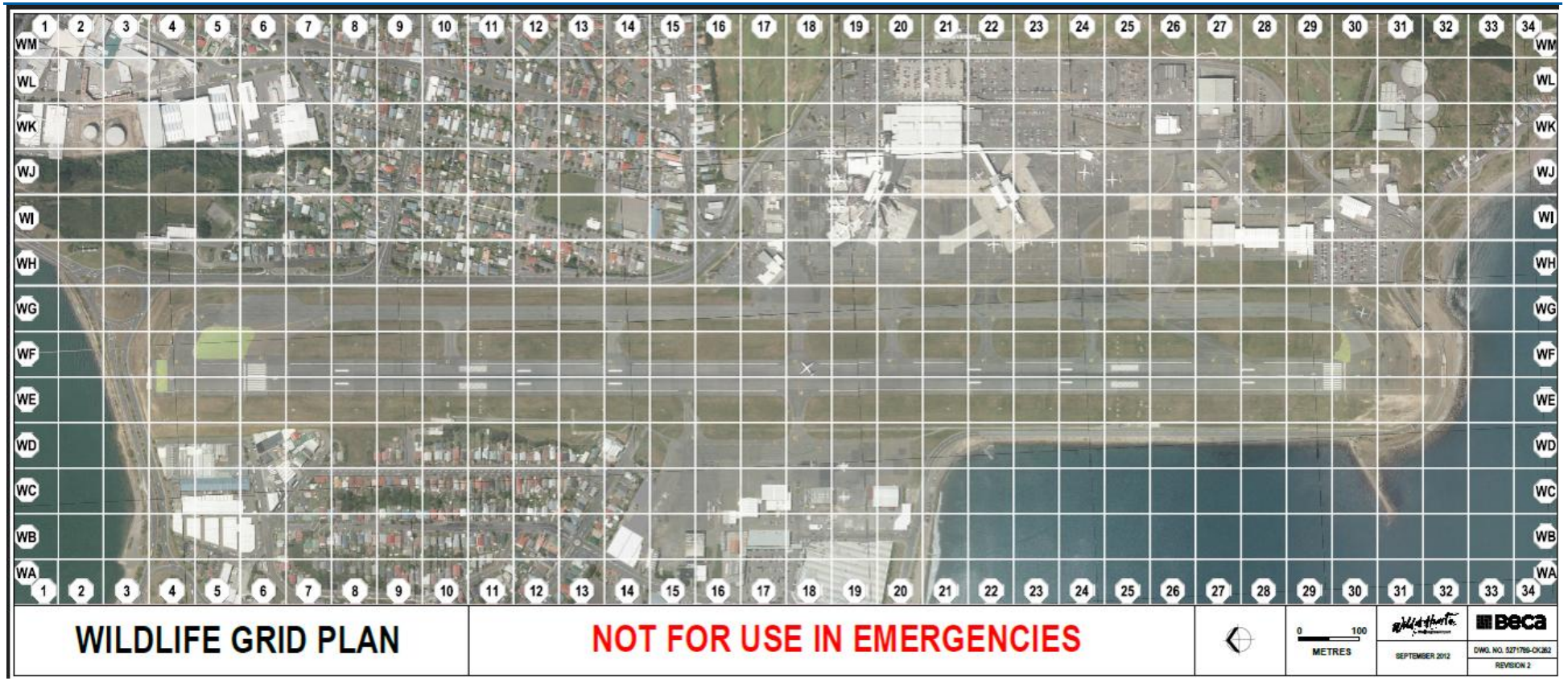

Figure 24. Wildlife grid plan to be used in corroboration with the Banded Dotterel records at WIA during the breeding season (Table 15)

Table 16. April 2025 Moa Point herpetofauna survey results

Tracking tunnel no.	Species				
	Skink	Gecko	Snail damage	Hedgehog	Rodent
1					
2			1		1
3	1				1
4			1		1
5	1		1		1
6	1	1	1		
7			1		
8	1				
9	1				1
10	1				1
11					1
12			1		1
13			1		1
14			1		
15					
15b			1		
16					1
17	1		1		
18			1		1
19			1		1
20	1				1
21					
22					
23					
24					1
25					
Total Detections	**8**	**1**	**12**	**0**	**14**
Detection Rate (%)	**32**	**4**	**48**	**0**	**56**

Table 17. April 2025 Miramar Golf Course herpetofauna survey results

Tracking tunnel no.	Species				
	Skink	Gecko	Snail damage	Hedgehog	Rodent
1					
2			1		
3					1
4				1	
5					1
6	1		1		
7			1		1
8			1		1
9					1
10					1
11					
12	1				1
13	1				
14	1				1
15					
16	1		1		
17					
17a					
18			1		1
19			1		
20			1		1
21			1		1
Total Detections	**5**	**0**	**9**	**1**	**11**
Detection Rate (%)	**24**	**0**	**43**	**5**	**52**

Appendix D Additional Figures and Maps

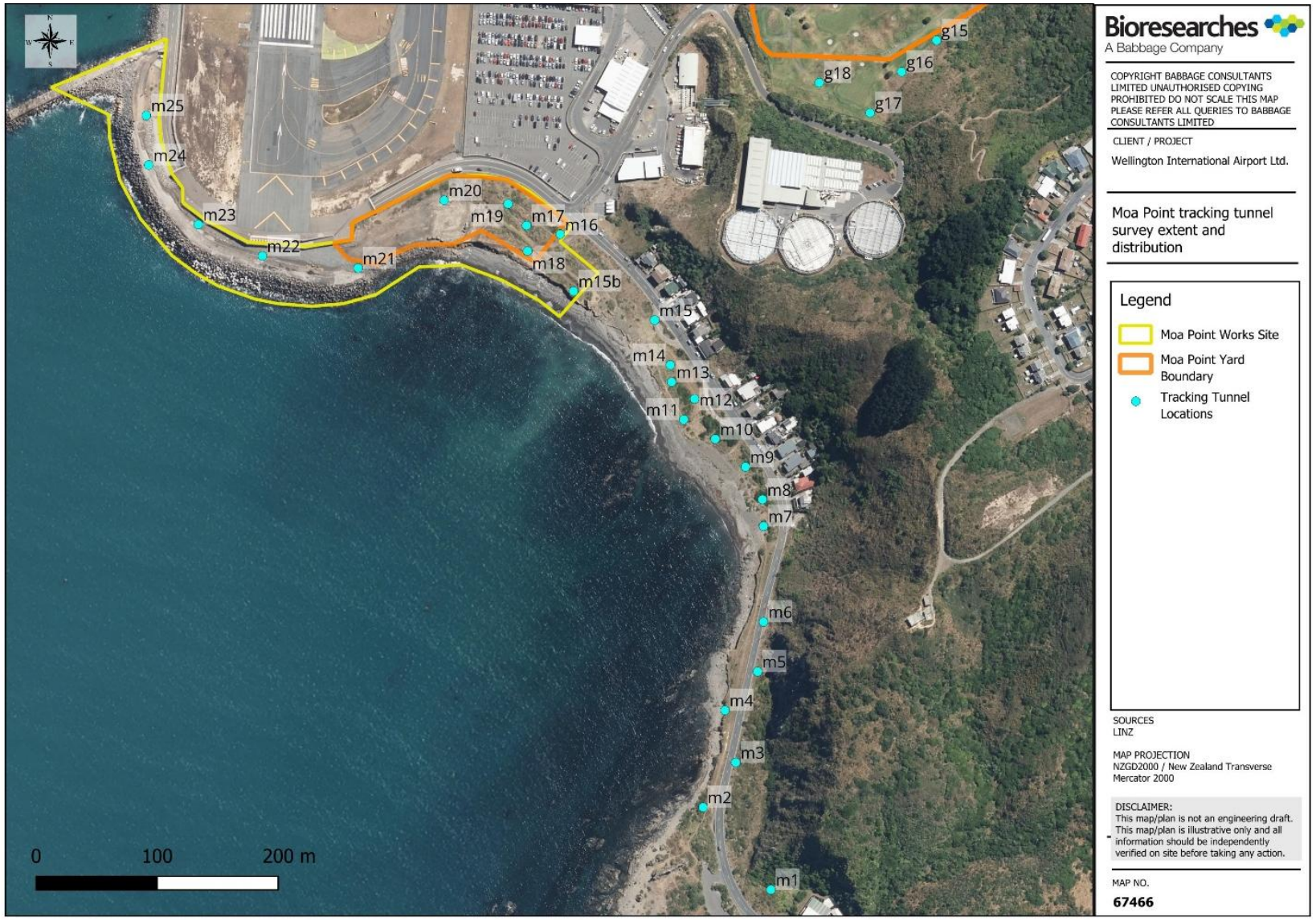

Figure 25. Moa Point Tracking tunnel survey extent and distribution

Figure 26. Miramar Golf Course Tracking tunnel survey extent and distribution

Figure 27. Herpetofauna records within a 5km radius from the site used within the desktop analysis. Records from the east were not included due to the geographical separation.

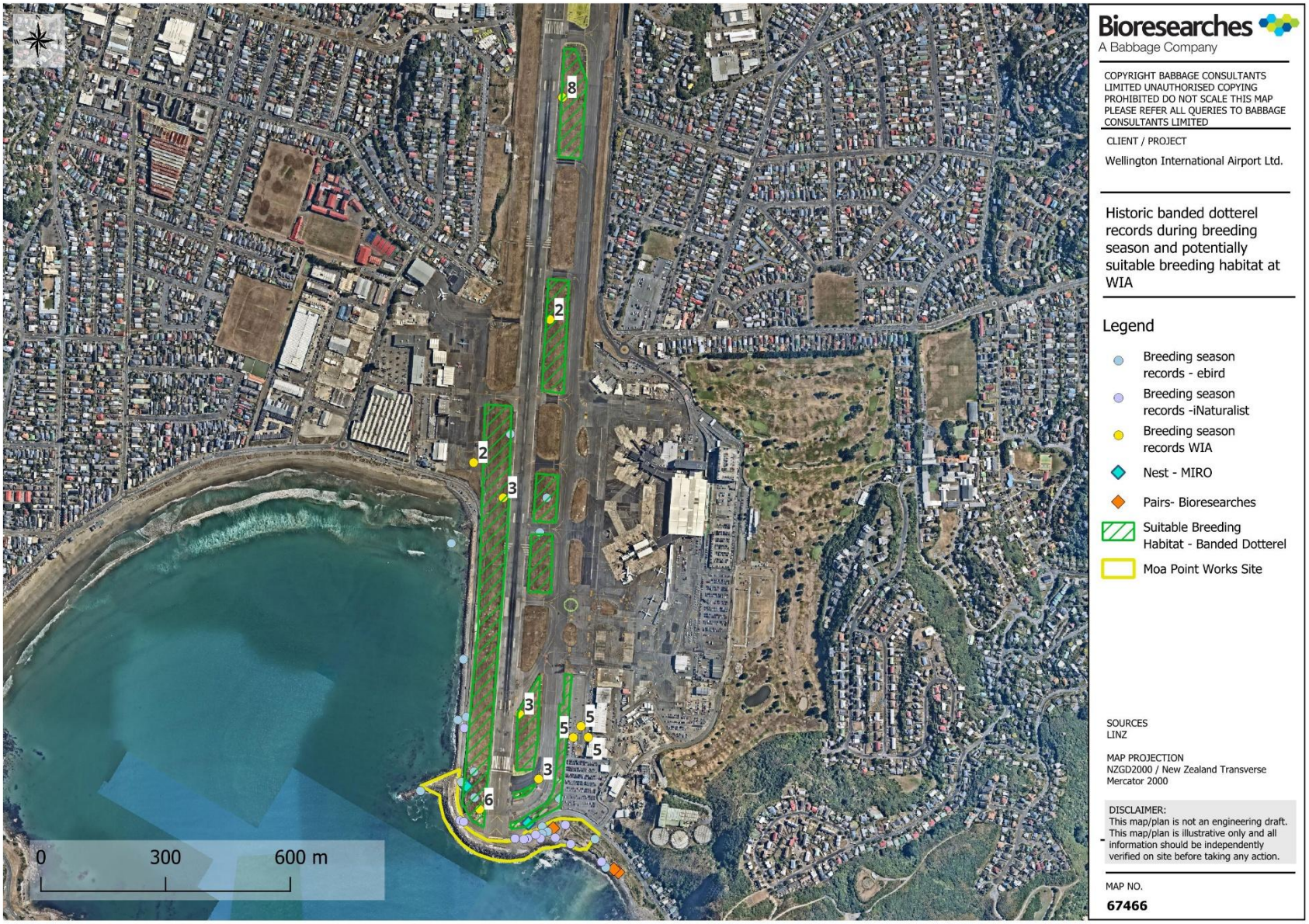

Figure 28. Suitable habitat at WIA for banded dotterel; identified from historic records of banded dotterel during several breeding seasons.

Figure 29. Maximum banded dotterel breeding opportunities at WIA as per the maximum nest distribution limits (~150m) from NZ Birds online [39]

[39] Banded Dotterel

Figure** Error! Main Document Only.. **Tracking tunnel survey ink cards; (L) prints of native gecko and native skinks at Moa Point; (R) native skink prints from Miramar Golf Course

Appendix E Authors Credentials

Chris Wedding
Ecology Manager
M.Sc. (Hons), MEIANZ,

I am the Ecology Manager at Bioresearches (Babbage Consultants). I hold a Master of Science degree from Massey University and have 18 years' professional experience in ecology. I am a full member of the Environment Institute of Australia and New Zealand and am a current committee member and former President of the New Zealand Herpetological Society (2012-2015).

I specialise in terrestrial ecology, including biodiversity offset and compensation, and have particular expertise with native reptiles and amphibians. I hold multiple Wildlife Authorities to survey indigenous reptiles and amphibians throughout New Zealand, manage lizards within the Auckland Region as a mitigation tool and hold indigenous lizards in captivity, including for "insurance" and "Breed for release" purposes. I have been an invited participant in Department of Conservation-led workshops for lizard mitigation research needs and co-authored Auckland Council's technical publications on the Conservation status of reptiles (Melzer et al. 2022a[40]) and amphibians (Melzer et al. 2022b[41]) in the Auckland Region. I have also recently co-authored a peer reviewed paper on the application of the Biodiversity Compensation Model in New Zealand[42]

I confirm that, in my capacity as co-author of this report, as well as a reviewer of the Ecological Management Plans, I have read and abide by the Environment Court of New Zealand's Code of Conduct for Expert Witnesses Practice Note 2023.

[40] Melzer, S., R. Hitchmough, D. van Winkel, C. Wedding, S. Chapman, M. Rixon (2022a). Conservation status of reptile species in Tāmaki Makaurau / Auckland. Auckland Council technical report, TR2022/3

[41] Melzer, S., R. Hitchmough, D. van Winkel, C. Wedding, S. Chapman, M. Rixon, V. Moreno, J. Germano (2022b). Conservation status of amphibian species in Tāmaki Makaurau / Auckland. Auckland Council technical report, TR2022/4

[42] Baber, M.. Quinn, J., Craig, J., Bramley, G., Lowe, M., Webb, C., Ussher, G., Whiteley, C., Kessels, G., Davies, F., Markham, J., Miller, D., van Winkel, D., Wedding, C., Chapman, S. (2025). The Biodiversity Compensation Model: a framework to facilitate better ecological outcomes. New Zealand Journal of Ecology 49(1):3591

Michaela Scarrott
Terrestrial Ecologist
BSc, MEIANZ

I am an ecologist specialising within the terrestrial environment with a particular focus on avifauna and herpetofauna. My experience includes writing ecological impact assessments, implementing fauna management, and undertaking translocations of terrestrial fauna for various roading, infrastructure projects (including airports, quarries, mines, windfarm) and housing developments. My skill sets include visual and aural surveys of birds (terrestrial and shorebirds) and herpetofauna, utilising various methodologies to target cryptic species. I am an accredited Kiwi Handler (KAH0515), and have several years' experience working with penguins, am a certified level 1 Department of Conservation bander and mist net extractor for passerines, parrots and waterfowl. I have coordinated various monitoring projects for avifauna and lizards nationally within my career and voluntarily, leading surveys for conservation projects for the Motuihe Trust and have been involved with projects for Motu Kaikōura Trust, Sanctuary Mountain Maungatautari, Save the Kiwi, ARK in the Park and various ongoing research projects. I am a full member of the Environment Institute of Australia and New Zealand.
I confirm that, in my capacity as an author of this report, I have read and abide by the Environment Court of New Zealand's Code of Conduct for Expert Witnesses Practice Note 2023.

Dr. Michael Anderson

I am a Senior Ecologist at Bioresearches (Babbage Consultants). I hold a Bachelor of Science and Master of Science from the University of Auckland and A Doctor of Philosophy from Massey University. I am a full member of the Environment Institute of Australia and New Zealand.

I specialise in terrestrial ecology, including biodiversity offset and compensation, and have particular expertise with native avifauna, having authored 25 peer-reviewed scientific publications, predominantly on native birds.

I confirm that, in my capacity as reviewer of this report, I have read and abide by the Environment Court of New Zealand's Code of Conduct for Expert Witnesses Practice Note 2023.

Treffery Barnett

BSc, MSc (Hons), MEIANZ

I am a Senior Freshwater Ecologist and technical director at Bioresearches (Babbage Consultants) with over 30 years experience in freshwater, marine and coastal ecology throughout New Zealand. My experience includes project management in freshwater and marine ecology, Environmental Effects Assessments and restoration of streams and wetlands, Stream Ecological Valuations (SEV) assessments, native freshwater fisheries, environmental monitoring, including water quality monitoring for industry and wastewater discharges, and am a specialist taxonomist on the identification and analyses of freshwater and marine invertebrates. My experience includes assessing the effects land development, quarries and roads on freshwater and coastal aquatic ecosystems, reporting on freshwater and marine ecosystems in effects monitoring, baseline surveys and habitat evaluations. I am a full member of the Environment Institute of Australia and New Zealand.

I confirm that, in my capacity as reviewer of this report, I have read and abide by the Environment Court of New Zealand's Code of Conduct for Expert Witnesses Practice Note 2023.

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