

Southern Seawall Renewal Project

Avifauna Management Plan

for: Wellington International Airport



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Cover Illustration: New Zealand Banded dotterel chick and adult at Wellington International Airport, Photo: Steve Wass¹

¹ [Dotterels at home on airport runway | The Post](#)

EXECUTIVE SUMMARY

A summary for avifauna management required during the breeding season is provided in Table 1, highlighting locations for nest checks, and subsequent management protocols should an active nest be found on-site during the Project. Further details on the required protocols for each breeding species can be found in the relevant section, as indicated in the table below.

Table 1. A summary of breeding and management requirements within the Project Areas, as discussed within this management plan

Common name	Breeding Habitat	Location	Timings where management is required / breeding seasons												Management Required	Buffer zone (m)	Section Detailing Management		
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec					
Kārearea	Ground with cover (boulder, fallen log)	MGC Yard / Tukanae Reserve															Nest check prior to works	50-100	5.1.1
Variable oystercatcher	Gravel, sand or soil	Moa Point / Seawall															Nest check prior to works	50	4
Banded dotterel	Gravel, sand or soil	Moa Point / Seawall															Nest check prior to works	50	4
Fantail	Shrubs / Trees	MGC Yard															Nest checks prior to habitat clearance	20	5.1.2
Grey warbler	Trees																		
Kingfisher	Trees																		
Morepork	Trees																		
Paradise shelduck	Trees / Ground																		
Pūkeko	Ground																		
Silvereye	Shrubs / Trees																		
Tūi	Trees																		
Welcome swallow	Buildings																		
White faced heron	Trees																		

Note: The colour gradient indicates the species national conservation status': dark= Threatened/At-Risk; light= Not Threatened. Blue = breeding season/ management required.

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1 INTRODUCTION

This Avifauna Management Plan (AMP) supports the substantive Fast-track Approvals application for Wellington International Airport Ltd (WIAL) Southern Seawall Renewal to minimise the effects of this project (the Project) on potentially present nesting native birds (e.g., banded dotterels, variable oystercatchers, New Zealand bush falcon/ kārearea) during the Project.

It is noted that banded dotterel are known to seasonally breed south of the runway within the Project footprint, and other species have the potential to breed on site within suitable habitat, or adjacent to the site, which may be impacted by the proposed construction works. An Ecological Impact Assessment (Bioresearches, 2025) (EclA) has recommended that this management plan be implemented to mitigate potential adverse effects on native birds during the proposed Project works.

This AMP aims to:

1. Prevent banded dotterels and variable oystercatchers from establishing nests within works areas (being the Project area as set out below) during construction and, if nesting does occur within or adjacent to the works area, to minimise disturbance on these breeding birds and their nests.
2. Minimise disturbance to potentially nesting kārearea by specifying setbacks and controls should they nest within 100 m of construction works (e.g., the grassy embankment adjacent to Miramar Golf Course).

Where possible, works can continue if they are determined not to have an impact on breeding birds as determined by the Project Ornithologist and/or approved ecologist (Project Ornithologist). This includes impacts on their nesting activity (e.g., incubation, brooding), their chicks once they are mobile, and avoiding inducing stress responses (e.g. disturbance flight initiation, alarm calling) and disruption to other natural behaviours (e.g., foraging).

1.1 Project Area

The Project includes two sites with suitable avifauna habitat, where works will be undertaken as part of the Project, being the Miramar Golf Course Yard (MGC Yard) and an area adjacent to the MGC Yard and Moa Point, including the Moa Point Yard.

The Miramar Golf Course is located directly east of Wellington International Airport and the MGC Yard will be the primary storage facility and associated works yard for rock and armour units required for the seawall construction.

Moa Point is located along the southern coastal margin of Wellington International Airport and is the site for the proposed seawall renewal works, Moa Point Yard, the Eastern Bank Remediation, and the stage 1 and 2 Kororā colonies. Further details about the establishment of the Kororā colonies are provided elsewhere, and it is not anticipated that they will have any adverse effects on other bird species that require management actions.

1.2 Objectives

The objective of this AMP is to avoid mortality, injury, and significant disturbance to nesting native birds. Further, this AMP aims to achieve the following:

- Minimise adverse effects on breeding success of avifauna from the proposed activities.

This objective will be achieved by:

- Where practicable, installing Moa Point Construction Yard prior to the banded dotterel breeding season (avoid disturbance to breeding birds).
- Using current best practice (or new advances identified during Project operation) to survey for breeding activity and monitor active nests during incubation, and chicks during their dependent stage prior to fledging (avoid and minimise mortality of wildlife protected by the Wildlife Act 1953);
- Setting out standard surveying and monitoring protocols that are to be followed.

This AMP addresses the following:

- A summary of the affected habitat and species covered by the plan;
- Avifauna survey and monitoring procedures; and
- A summary of the recommended bird breeding management actions.

1.3 Statutory Context

Birds (avifauna) comprise a significant component of New Zealand’s terrestrial fauna; 491 taxa are currently recognised (Robertson et al., 2021), of which 241 are classed as non-vagrant and native species. Of these 241 species, 74% are listed as either 'Threatened', 'At Risk', or 'Data Deficient'.

Almost all native birds (except for black-backed gulls and spur-winged plovers) are legally protected under the Wildlife Act 1953 (and subsequent amendments), and vegetation and landscape features that provide significant habitat² for native fauna (including birds) are specifically recognised under the Resource Management Act 1991³, the New Zealand Coastal Policy Statement (2010; Policy 11) and in the National Policy Statement for Indigenous Biodiversity (2023). Thus, statutory obligations require the management of native birds where they or their habitats are threatened by land disturbance or development.

1.4 Overview of the Avifauna Management Plan

The AMP requires actions to avoid adverse effects on native birds by way of breeding surveys and nest monitoring as required. The credentials and contact details of the Project Ornithologist are provided in Table 2. A summary of the proposed AMP activities has been provided as a checklist in Table 3. For details on each of these elements, refer to the appropriate section within the AMP body text.

Table 2. Details of Project Ornithologist

Credentials and Contact Details of Project Ornithologist	
Project Ecologist/Ornithologist	Dr. Michael Anderson
Credentials	PhD, 23 years of ornithology experience
Email	Michael.anderson@bioresearches.co.nz
Contact number	0210677453

² “Significant habitat” is habitat that offers important food resources, refuge, and supports breeding populations.

³ RMA, section 6(c).

Table 3. Avifauna Management Plan (AMP) Checklist

Project start-up	Required of:	Relevant section of AMP	Completed
Avifauna Management Plan	Contractor, approved under the Fast Track Approvals process		
Timing of the implementation of the AMP		Table 1; throughout	
Summary of affected habitats and species		Section 2 and 3	
Works management			
Pre-work survey for the presence of birds and breeding status/nest presence.	Ornithologist	Section 4.2	
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 7	
Demarcating active nests with a 50 -metre boundary (e.g. tape and posts) and a 50 metre no go zone.	Ornithologist, project contractor	Section 4.3	
Daily checks for chick locations once chicks mobile	Ornithologist, project contractor	Section 4.4	
Monitoring and Completion report	Ornithologist	Section 7	
Works nest management (NZ Falcon / kārearea)			
Demarcating active nests with a 100 -metre boundary (e.g. tape and posts). Exceptions can be made in certain circumstances as described in Section 5.1	Ornithologist, project contractor	Section 5.1	
Monitoring and Completion report	Ornithologist	Section 7	

2 AVIFAUNA SPECIES PRESENT, AND POTENTIALLY PRESENT ON SITE

A full desktop survey and site investigations were carried out as part of the EclA (Bioresearches, 2025). A summary of the species detected or likely present is found in Table 4. More details are provided in Section 2.1 for Threatened and At-Risk species that are potentially present.

Banded dotterels (*Charadrius bicinctus bicinctus*) have a history of breeding on site at Moa Point along the seawall to the south of the Wellington Airport runway, and within the adjacent airport grounds (Figure 1). This site has been identified as one of four stretches of the Pōneke / Wellington City coastline that plays a particularly important role in maintaining indigenous coastal bird values within the city (McArthur, 2025). Several pairs were confirmed present within Moa Point and several were confirmed as breeding within the airport grounds during an on-site survey conducted by Bioresearches in October 2024 (Bioresearches, 2025).

Though there are no records of variable oystercatcher (*Haematopus unicolor*) breeding on site, there are records of individuals within the area (Figure 2) and suitable habitat on site to support breeding. Kārearea (*Falco novaeseelandiae ferox*) have also been recorded breeding within ~1 km of the MGC Yard and their presence has been recorded throughout the surrounding area (Figure 3). Based on breeding and sighting records, it was determined that Kārearea may use the adjacent grass embankment / forested hill site of the Tukenae Reserve for breeding. These species, although not previously recorded as breeding on site, have been included within this AMP as a precautionary measure.

Although kororā / little blue penguin (*Eudyptula minor*) are known to breed within the seawall at Moa Point, mitigation of adverse effects on this species is managed within a separate management plan and as such, will not be discussed further.

Other non-threatened native bird species may be present at both sites (Table 4). However, no other species have been recorded breeding at the Moa Point Yard and Seawall location. Any potential impacts will be minimal and sufficient adjacent habitat is available for their normal behaviours (i.e. roosting, foraging) to continue. Other non-threatened species that may be present at the terrestrial site (MGC) are covered by standard protocols for forest birds, outlined in the Executive Summary (see Table 4 and section 5.2).

Figure 1. (following page) Banded dotterel records during the breeding season, within the site and within Wellington Airport. Numbers depict the total number of individuals recorded over the survey season. Records derived from iNaturalist, MIRO, eBird, WIAL and Bioresearches.



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**Banded Dotterel records -
breeding season**

- Legend**
- Moa Point Indicative Works Area
 - Breeding season records - ebird
 - Breeding season records - iNaturalist
 - Breeding season records WIA
 - Nest - MIRO
 - Pairs- Bioresearches

SOURCES
LINZ

MAP PROJECTION
NZGD2000 / New Zealand Transverse
Mercator 2000

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This map/plan is illustrative only and all
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MAP NO.
67466

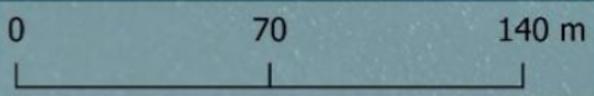




Figure 2. Variable oystercatchers spring records at Moa Point Beach. Sourced from eBird, Atlas

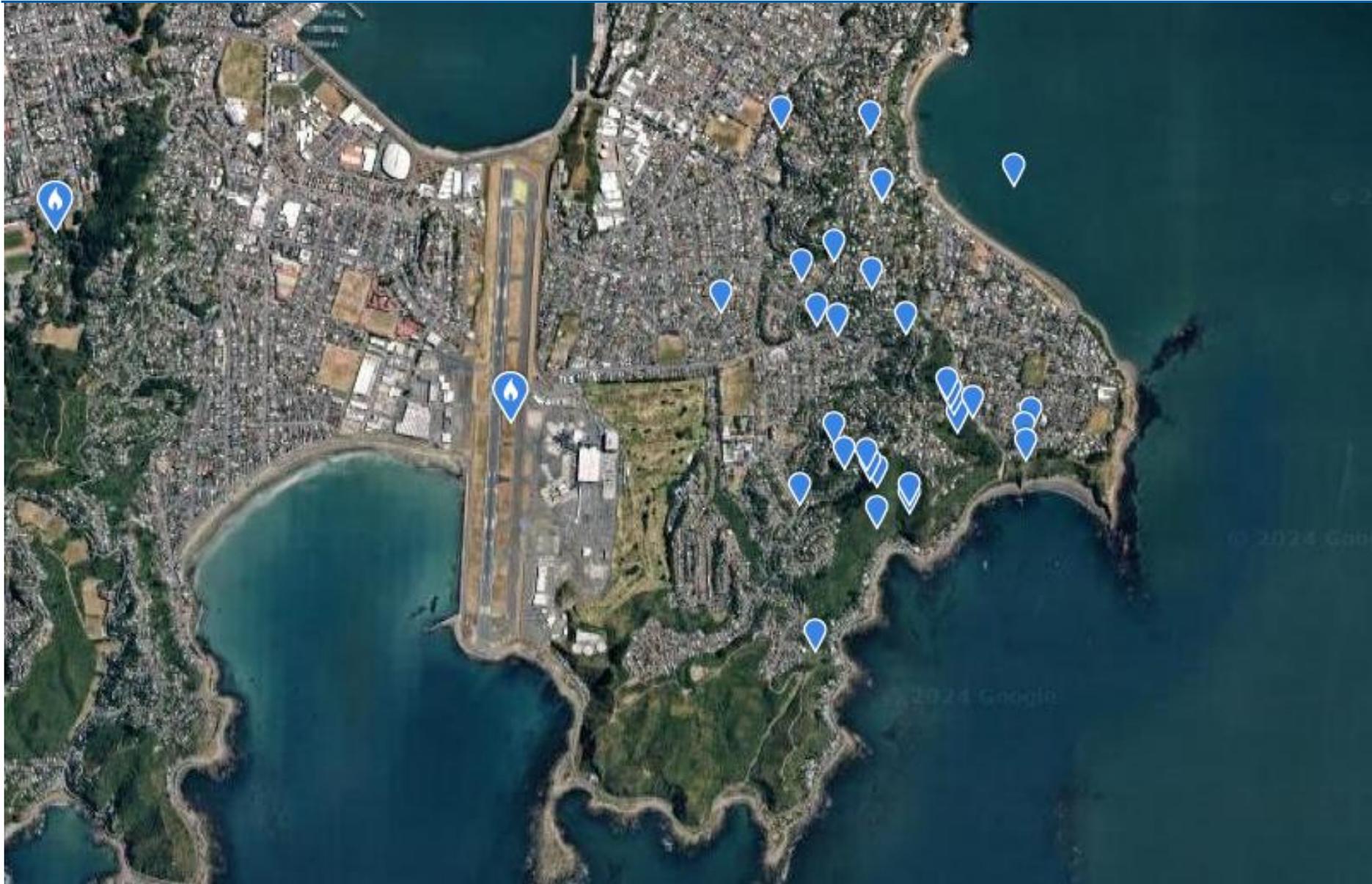


Figure 3. Kārearea records from the surrounding area. Sourced from eBird, Atlas. Note flame icons are general location selections by observers, not specific sighting locations. The marker on the runway is associated with 3 kārearea records.

Table 4. Avifauna recorded on site based on previous avifauna surveys⁴ and a desktop review of eBird and iNaturalist records within a 10 km radius of the site. Non-native species and marine-specific species have been omitted from the results. National and regional corresponding threat status is provided for each species. Potential to breed on site is based on the species' nesting requirements and habitat availability on site. Colour correlates to Threat Status for species considered to potentially breed on site.

Common name	Scientific name	National Threat Status*	Regional Threat Status**	Potential to breed on site
NZ Falcon / Karearea	<i>Falco novaeseelandiae ferox</i>	Threatened - Increasing	Threatened - Critical	Miramar Golf Course
Banded dotterel	<i>Charadrius bicinctus bicinctus</i>	At Risk - Declining	Threatened - Endangered	Moa Point
Variable oystercatcher	<i>Haematopus unicolor</i>	At Risk - Recovering	Threatened - Endangered	Moa Point
Fantail	<i>Rhipidura fuliginosa</i>	Not Threatened	Not Threatened	Miramar Golf Course
Grey warbler	<i>Gerygone igata</i>	Not Threatened	Not Threatened	Miramar Golf Course
Kingfisher	<i>Todiramphus sanctus</i>	Not Threatened	Not Threatened	Miramar Golf Course
Paradise shelduck	<i>Tadorna variegata</i>	Not Threatened	Not Threatened	Miramar Golf Course
Pied Stilt	<i>Himantopus leucocephalus</i>	Not Threatened	Not Threatened	Moa Point
Pūkeko	<i>Porphyrio melanotus</i>	Not Threatened	Not Threatened	Both Construction Yards
Ruru	<i>Ninox novaeseelandiae</i>	Not Threatened	Not Threatened	Miramar Golf Course
Silvereye	<i>Zosterops lateralis</i>	Not Threatened	Not Threatened	Miramar Golf Course
Tūi	<i>Prothemadera novaeseelandiae</i>	Not Threatened	Not Threatened	Miramar Golf Course
Welcome swallow	<i>Hirundo neoxena</i>	Not Threatened	Not Threatened	Miramar Golf Course
White faced heron	<i>Egretta novaehollandiae</i>	Not Threatened	Not Threatened	Miramar Golf Course
Caspian tern	<i>Hydroprogne caspia</i>	Threatened – Vulnerable	Threatened - Critical	No/ very low potential to breed on site
Little black shag	<i>Phalacrocorax sulcirostris</i>	Naturally Uncommon	Threatened - Endangered	
Wrybill	<i>Anarhynchus frontalis</i>	Threatened – Increasing	Threatened - Critical (RM)	
Reef heron	<i>Egretta sacra</i>	Threatened – Endangered	Threatened - Critical	
Spotted shag	<i>Stictocorbo punctatus</i>	Threatened – Vulnerable	Threatened - Critical	
Red billed gull	<i>Larus novaehollandiae scopulinus</i>	At Risk -Declining	Threatened - Vulnerable	
Kākāriki	<i>Cyanoramphus novaezelandiae</i>	At Risk - Relict	Threatened – Critical	
Kākā	<i>Nestor meridionalis septentrionalis</i>	At Risk - Recovering	Threatened - Endangered	
Pied Shag	<i>Phalacrocorax varius</i>	At Risk - Recovering	Threatened - Vulnerable	
Black shag	<i>Phalacrocorax carbo novaehollandiae</i>	At Risk – Relict	Threatened - Critical	
NZ Pipit	<i>Anthus novaeseelandiae</i>	At Risk - Declining	Threatened - Endangered	
White-fronted tern	<i>Sterna striata</i>	At Risk - Declining	Threatened - Critical	
Bellbird	<i>Anthornis melnura</i>	Not Threatened	Not Threatened	
Black-backed gull	<i>Larus dominicanus</i>	Not Threatened	Not Threatened	
Kererū	<i>Hemiphaga novaeseelandiae</i>	Not Threatened	Not Threatened	
Little shag	<i>Phalacrocorax melanoleucos brevirostris</i>	At Risk - Relict	Threatened - Endangered	
Whitehead	<i>Mohoua albigilla</i>	Not Threatened	Not Threatened	

Notes: *National Threat Status from Robertson et al. (2021). **Regional Threat Status (for Wellington Mainland) from Crisp et al. (2023). RM = Regional Migrant

⁴ Burgin, D and Ray S. (2020); Thompson, D (2021); PDP (2023); Bioresearches (2022); RMA Ecology (2023)

2.1 Threatened & At-Risk Species

The EclA (Bioresearches, 2025) determined that, of the fifteen ‘Threatened’ or ‘At-Risk’ bird species recorded near the site during the desktop study, many are not expected to be present because the site is lacking in their specific habitat requirements. Based on the outcomes of the EclA, only three of these species were either recorded on site or are considered to have potential to utilise the existing habitats on site for breeding. Further information about these species is provided below and their breeding seasons are summarised in Table 8. Breeding management recommendations are discussed within Section 4 and Section 5.

2.1.1 Banded dotterel / pohowera

Banded dotterel are a small coastal plover, identified by their brown upperparts and a broad chestnut breast band which intensifies during the breeding season (Pierce, 2013) (Photo 1). Banded dotterel have a conservation status within the Wellington Region of ‘Threatened – Endangered’ and a national status of ‘At-Risk - Declining’. The population trend for banded dotterel has changed from being stable to declining, attributed largely to the effects of flooding in the Wairarapa, introduced mammalian predators and anthropogenic impacts.



Photo 1. Banded dotterel (*Charadrius bicinctus*). Photo: Ben Ackerley (NZ Birds Online)

2.1.1.1 Breeding

Several pairs of banded dotterels have been recorded breeding along the foreshore directly south of Wellington International Airport runway (Figure 1) and use the western end of Moa Point Beach for feeding. This is the only known breeding population of banded dotterels found along the Wellington City coastline east of Sinclair Head.^{5,6}

Banded dotterel pairs are solitary and territorial, but there can be high concentrations of birds in good habitat. Birds begin to arrive on the breeding grounds and set up territories in July (later at high altitude) (Pierce, 2013).

⁵ <https://wellington.govt.nz/-/media/environment-and-sustainability/environment/files/wcc-coastal-bird-survey-report-2022.pdf>

⁶ <https://www.birdsnz.org.nz/wp-content/uploads/2024/10/Wellington-2409.pdf>

First eggs are laid in August to early November, in shallow scrapes in gravel, sand or soil, usually lined with tiny stones, occasionally shell (Photo 2). The clutch-size is nearly always three eggs, which are coloured grey to pale-green or olive with small dark spots. Incubation is performed by both adults for approximately 4 weeks and chicks fledge after another 5-6 weeks. During the fledgling period, chicks are active and will often leave the nest with the parents (Photo 2).

They are well known to nest on active earthworks sites and may utilise the laydown site during construction⁷. Breeding birds will aggressively defend nests, using behaviours that include screeching and distraction displays (including broken wing displays, Photo 3). Table 5 describes key breeding behaviour activities of the banded dotterel and their typical timing and duration.



Photo 2. Banded dotterel eggs (left) and chick on the runway at Wellington Airport. Photos: Left: Peter Frost, birdsnzonline.org.nz; Right: Steve Wass⁸

⁷ <https://nzta.govt.nz/assets/innovation-uploads/upload-12307/Guidance-in-relation-to-dotterels-Final-20-comb.pdf>

⁸ <https://www.thepost.co.nz/nz-news/350442832/dotterels-home-airport-runway>

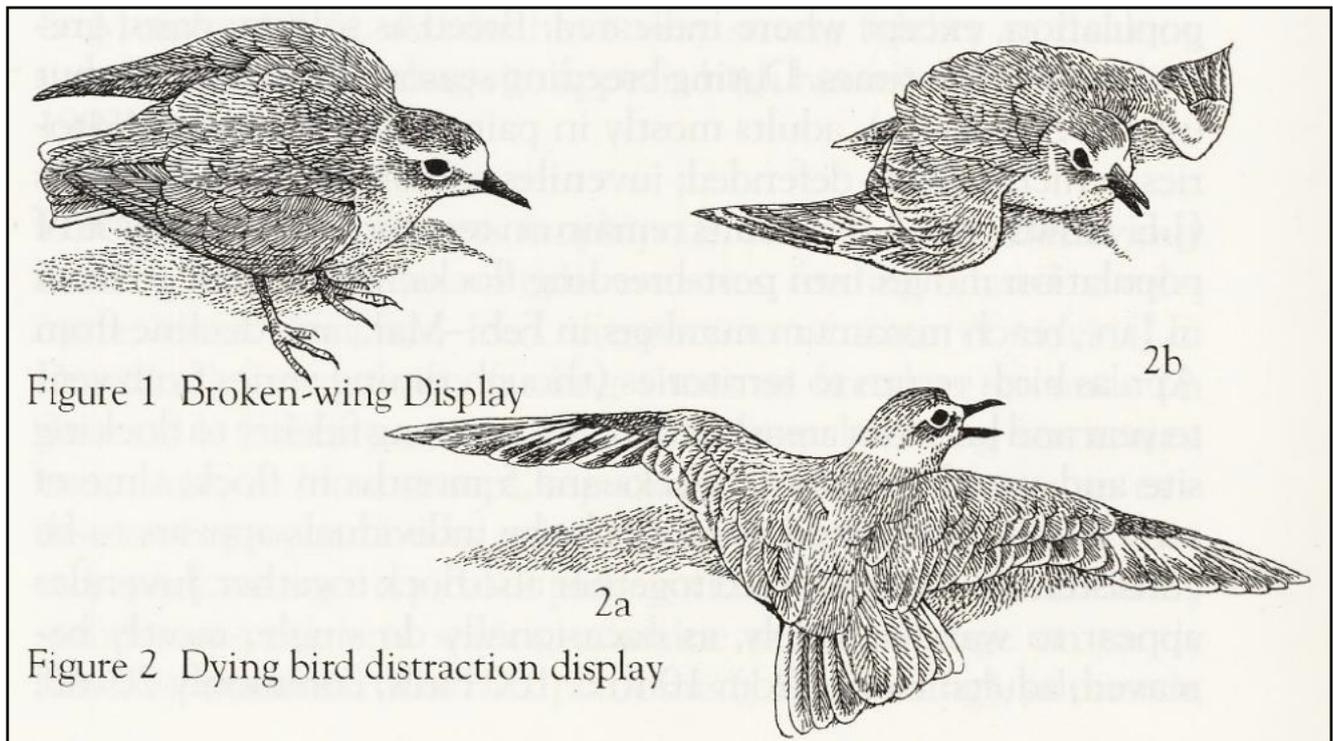


Photo 3. Broken wing / distraction display performed by breeding ground nesting birds (e.g., dotterel, variable oystercatchers) to lure predators away from a nest. Figure from Marchant & Higgins 1993

Table 5. Key breeding behaviour activities of the banded dotterel and their typical timing and duration.

Activity	Start Date	End Date	Typical duration
Establish Breeding Territory	July	August	Birds migrate to breeding grounds in July
Main breeding period	July	January	Seven months
Egg laying dates	August	December	Nests found at Moa Point by the end of Aug ⁹ .
Incubation period	October	onwards	Average 25-28 days
Fledgling period	November	onwards	35-42 days post hatching

⁹ Wellington-2409.pdf (birdsanz.org.nz)

2.1.2 Variable Oystercatchers / tōrea pango

Variable oystercatchers are a fairly large wader species bird, easily identified by their uniform black plumage (sometimes with white 'smudgy' belly) and bright orange bill (Dowding, 2013) (Photo 4).

Variable oystercatchers have a conservation status within the Wellington Region of 'Threatened – Endangered' and a national status of 'At-Risk – Recovering'. Breeding success is often low, largely due to depredation by a range of mammalian and avian predators, flooding of nests by the tides, and disturbance from human activity on coastlines. Future declines are predicted due to climate change, contributing to sea level rise and more frequent coastal storm surges.



Photo 4. Variable oystercatcher (*Haematopus unicolor*). Photo: J J Harrison (creative commons, Wikimedia)

2.1.2.1 Breeding

Variable oystercatchers breed in monogamous pairs and defend territories aggressively. Variable oystercatcher nests comprise a simple scrape in sand, shells or occasionally soil, and are normally unlined (Photo 5). Though there have been no records of birds breeding on Moa Point Beach, there is suitable habitat on site and with numerous records within the area - several of which are during spring when they breed (Figure 2) - there is a chance they may use the site for breeding.

Clutches are typically 2-3 eggs that are usually laid from October onwards. If nests fail, a second replacement clutch may be laid. The incubation of eggs is shared by males and females and usually lasts ~28 days. Chicks are quickly mobile after hatching (< 2 days) but will not fly until about 6-7 weeks. Parents will aggressively defend chicks for extended periods, often until after they have fledged (i.e. can fly). Breeding birds will aggressively defend nests using behaviours that include dive-bombing, screeching, and distraction displays (including broken

wing displays, like dotterels; Photo 3). Table 6 describes key breeding behaviour activities of the variable oystercatcher and their typical timing and duration.



Photo 5. Variable oystercatcher on incubating eggs on a nest (left) and chicks in a nest (right). Photos: left image Craig McKenzie, right image Graham Taylor (<https://nzbirdsonline.org.nz>).

Table 6. Key breeding behaviour activities of the variable oystercatcher and their typical timing and duration

Activity	Start Date	End Date	Typical duration
Establish Breeding Territory	September	-	Sometimes territories are maintained year-round
Main breeding period	September	March	Seven months
Egg laying dates	September	January	Rarely lay in September, usually October onwards
Incubation period	October	onwards	Average 28 days (range: 25-32 days)
Fledgling period	November	onwards	40-50 days post hatching

2.1.3 New Zealand bush falcon/ kārearea

The New Zealand bush falcon/kārearea is a medium-sized raptor that hunts small passerines. It has a dark brown back, streaked cream breast, long pointed wings, and a long tail (Photo 6). All ages show a dark eye and a distinct moustache (malar stripe) running from the base of the strongly hooked bill down the face. During the breeding season, adults often defend territories with a loud *kek kek kek* call.

Often mistaken for the larger swamp harrier (*Circus approximans*), which glides slowly in search of carrion and small prey, the kārearea is typically seen in rapid, active flight and can reach speeds of up to 200 km/h¹⁰.

In the Wellington Region, kārearea are classified as *Threatened – Critical*, with a national status of *Threatened – Increasing*. Population declines are linked to breeding habitat loss from land-use intensification and clearance, predation by introduced pests (cats, mustelids, pigs, possums, hedgehogs), electrocution from uninsulated powerlines, and illegal persecution (shooting, trapping, poisoning). Numerous sightings have been recorded across the Wellington peninsula, including at Wellington International Airport (Figure 3).



Photo 6. New Zealand Falcon | kārearea (*Falco novaeseelandiae ferox*). Photo: M. Scarrott.

2.1.3.1 Breeding

Kārearea almost always nest on the ground. Eggs are laid into a simple scrape in the ground with some variation of cover, such as under a large boulder or a fallen tree, to shelter them from the elements and aerial predation (Photo 7). In hill country they generally nest part way up a slope. In forested areas this may be on the ground where a tree fall affords a suitable view over the surrounding gully.

¹⁰<https://www.doc.govt.nz/nature/native-animals/birds/birds-a-z/nz-falcon-karearea/#:~:text=Introduction,of%20our%20most%20spectacular%20birds.&text=Conservation%20status%3A,form%20is%20Threatened%E2%80%93Nationally%20Endangered>

Kārearea nest in a variety of habitats, including rough grassland and mature forest (native or exotic, such as pine plantation). Rank grass on the upper embankment of the Miramar Golf Course (adjacent to the MGC Yard) could provide breeding opportunities. However, nesting near the site is considered unlikely given the abundance of similar habitat in the Wellington Region, including large areas within the adjacent Rangitatau Historic Reserve. It cannot be entirely ruled out, as several pairs breed in the Wellington Town Belt, forage in the central city, and have been recorded at and around the site (Figure 3).

Potential indicators of a breeding pair include the male circling high above the territory while calling *kek-kek*. Courtship behaviours may involve aerial displays such as noisy swooping and chasing flights, as well as food transfers between individuals. The female’s distinctive whining *whee-up* call is also a reliable indicator of breeding activity. Key breeding behaviours, along with their typical timing and duration, are outlined in Table 7.



Photo 7. Kārearea eggs on a nest (left) and chicks in a nest on the ground (right). Photos: left image Andrew Thomas, right image Marlborough Falcon Conservation Trust, (<https://nzbirdsonline.org.nz/species/new-zealand-falcon>), (<https://kareareafalcon.org>)

Table 7. Key breeding behaviour activities of the kārearea and their typical timing and duration¹¹.

Activity	Start Date	End Date	Typical duration
Establish Breeding Territory	August	November	
Main breeding period	August	March	Ten months
Egg laying dates	August	January	
Incubation period	August	February	25-35 days
Fledgling period	September	Mid- March	~75 days post hatching

2.1.4 Fluttering Shearwater (and other seabirds)

2.1.4.1 Status and distribution

Fluttering shearwaters (At Risk – relict, *Puffinus gavia*) are an endemic seabird that breeds on offshore islands from Northland to Cook Strait and the Marlborough Sounds. They are regionally common in Cook Strait and

¹¹ www.nzbirdsonline.org.nz/species/new-zealand-falcon

within Wellington Harbour outside the breeding colonies. Their chicks fledge in mid to late summer (Gaskin, 2013).



Figure 4. Fluttering shearwater adult on the ground (left) and in flight (right). Images from New Zealand Birds Online (<https://www.nzbirdsonline.org.nz/species/fluttering-shearwater>).

2.1.4.2 Relevance to the Project

Although there are no colonies at the airport, fluttering shearwaters forage widely through Cook Strait and occasionally enter Lyall Bay and Wellington Harbour. During fledging, inexperienced juveniles are vulnerable to disorientation by artificial lights, which can result in birds becoming grounded on hardstand areas, haul roads and within construction compounds. This species is the most likely to be grounded by artificial lights, but other seabirds may also exhibit the same behaviour. Any protocols developed for fluttering shearwater can be used for other species as well.

2.1.4.3 Period of elevated risk (juvenile fallout window)

Fledging occurs January–February in central New Zealand, including the Cook Strait region. Grounding risk from artificial light is highest on dark, overcast, low-moon nights during this period, and may extend into early March in some years. <https://www.nzbirdsonline.org.nz/species/fluttering-shearwater>

2.2 Non-threatened native species

Eleven ‘non-threatened’ native terrestrial avifauna species have been identified, based on records within the desktop survey, and habitat availability on site, with potential to utilise areas of the site for breeding. Under the Wildlife Act 1953, direct harm to these species, their nests, eggs, and nestlings, must be avoided. Table 8 (below) outlines the breeding season timelines for these species, indicating that the spring/summer months are the main breeding months for most species. On site vegetation clearance and works impacting nesting habitat should therefore be avoided during key parts of their breeding season (from August to March inclusive) where possible. If vegetation/nesting habitat removal is required within the bird nesting season, a suitably qualified ecologist and/or ornithologist must check vegetation/habitat for nests before clearance. See Section 4.2, 5.1.1, and 5.2 for details on pre-vegetation clearance check requirements.

2.3 Breeding seasons summary

Table 8. A summary of the TAR avifauna breeding seasons, with potential to breed on site. Indicative breeding months (in blue) are from New Zealand Birds online (nzbirdsonline.org.nz) and includes both egg-laying and nestling dates

Common name*	Breeding Season											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Banded dotterel, pohowera												
New Zealand bush falcon / kārearea												
Variable oystercatcher, tōrea pango												
Fantail, pīwakawaka												
Grey warbler, riroriro												
Kingfisher, kōtare												
Morepork, ruru												
Paradise shelduck												
Pūkeko												
Silvereye, tauhou												
Tūī												
Welcome swallow, warou												
White faced heron												

Note: *The colour gradient indicates the species conservation status': dark= Threatened/At-Risk; light= Not Threatened.

3 SITE CHARACTERISTICS

3.1 Ecological Context

The proposed Project will utilise two sites: Moa Point (encompassing the Moa Point Yard, seawall construction area, and Eastern Bank Remediation) and the MGC Yard for associated works. These areas are generally very open environments, including coastal grasses and shrubs, amenity trees and grassland (rough and maintained). Detailed site characteristics are provided in the EclA (Bioresearches, 2025).

Banded dotterels are likely to forage within the intertidal zone at Moa Point Beach during both breeding and non-breeding seasons. They may also utilise coastal habitat, including the proposed Moa Point Yard, and runway grassland with unimpeded sightlines for breeding. Dotterels favour open, relatively flat areas that allow clear visibility of potential predators. Variable oystercatchers breed in similar habitats.

Although unlikely, kārearea may utilise the upper embankment rank grassland adjacent to the MGC Yard for breeding.

3.2 Site Description

WIAL requires reconstruction of its southern seawall defences to protect the Airport and associated infrastructure from wave inundation and coastal erosion, and is located on the southern extent of the Airport runway and property. Works would include reconstruction of the Southern Seawall, establishment and operation of laydown areas, delivery of materials, earthworks and heavy vehicle movements. The overall construction programme will take approximately six to eight years, with the seawall construction itself taking 24-30 months. To maintain Airport operations, most construction works would be required to be outside the Airports core operational hours; however, the seawall and Moa Point Yard will be operational 24 hours a day, and there will be some limited operational hours for the MGC Yard between 8pm and 6:30am.

Following a site visit by Bioresearches ornithologists in September 2024, several areas within the works extent have been identified as potential nesting sites for banded dotterel and variable oystercatcher at the Moa Point Yard and kārearea at MGC. These are shown in Figure 5.

Figure 5 (following page). Potential breeding habitats for coastal avifauna and karearea identified during on site surveys and desktop analysis. Note potential habitat for karearea has only been identified within 100m of the site where management provisions would be triggered if breeding occurred (below).



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Location of work sites,
Kororā colonies, and
suitable shorebird and
karearea breeding habitat.

Legend

-  Moa Point Works Site
-  MGC Yard Boundary
-  Korora Colony - Stage 1
-  Korora Colony - Stage 2
-  Potential coastal avifauna breeding habitat
-  Potential karearea breeding habitat

SOURCES
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information should be independently
verified on site before taking any action.

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4 COASTAL AVIFAUNA BREEDING MANAGEMENT

Banded dotterels are highly likely to breed seasonally within the Moa Point Works Site and have been recorded nesting there on multiple occasions. The MGC works site has the potential to become a breeding site as well, as banded dotterels are known to nest within construction sites. Although variable oystercatchers have not previously bred on site, they are included in this plan as a precautionary measure due to the availability of suitable breeding habitat. Management options provided apply to both species, as their requirements are broadly comparable, with species-specific measures included where appropriate.

Management of dotterels in proximity to construction sites is a common consideration in roading and development projects (Bannock, 2012). This plan builds on established protocols and methodologies, including those implemented in previous dotterel management projects (Bioresearches, 2024).

The following section outlines potential management actions to avoid or minimise adverse effects from planned earthworks and construction activities associated with the seawall and related works. These measures focus on reducing both direct and indirect impacts, including disturbance, and are intended solely for the duration of the construction period rather than as long-term management strategies.

4.1 Deterrence of birds prior to nesting

Banded dotterels typically establish territories **from July**, with variable oystercatchers following in September. **Early intervention** to prevent territory establishment and nesting is the most effective way to avoid construction delays.

- Establish the Moa Point Yard works area between February and June and implement deterrent measures during this period (see Table 9). Ongoing construction activity will further reduce site attractiveness.
- Establish the MGC Yard works area between February and June and implement deterrent measures during this period (see Table 9). Ongoing construction activity will further reduce site attractiveness.
- Table 9 outlines methods to discourage prospecting and nesting; these have low–moderate effectiveness, and birds may acclimatise. The most effective approaches obstruct the birds’ line of sight, used for detecting threats while nesting.
- Permanent deterrence requires converting suitable habitat to unsuitable surfaces, typically by making them impenetrable, as nests are shallow ground scrapes (note that the Project will rehabilitate this area to be suitable to nesting dotterels following works).
- Multiple nesting attempts will occur throughout the breeding season, and therefore periods of reduced works activity, such as long weekends, may increase nesting risk. Continuous deterrence- human presence, active works, or rock piles- should be paired with regular avifauna surveys to detect prospecting pairs and adapt measures as needed.

Table 9. Methods for deterring prospecting banded dotterels and variable oystercatchers (modified from Bannock, 2012).

Method	Likelihood of success	Comments
Human activity	Low	Introducing increasing human activity, such as dog walking and the regular use of the area by people may deter dotterels.
Site activity	Low	Use of machinery may temporarily deter dotterels.
Metallic tape	Low	Use of tape/streamers that flutter in the wind. Can be effective until birds acclimatise (~3 weeks).
Silt fences	Moderate	Erecting shade cloth at knee height, place in rows, spaced 5-10 metres apart may block the birds view. This should be in coordination with WIAL aviation safety as the breeding site is adjacent to an active runway.
Rock piles / concrete barriers	Moderate	Positioning piles of rocks or other large materials (i.e., concrete barriers, bricks, wood) in areas with open vantage, will block the birds' view and deter nesting. This method is recommended in areas less suitable for silt fencing, such as areas with high winds, narrow areas on site, or areas where poles can't be securely fixed to the ground. Any small materials such as gravel and sand should be avoided as dotterels can create nests in these materials. Additionally, the creation of new elevated flat platforms should be avoided, as this can create a new nesting location too.
Machinery	Moderate	Park large machinery close to where dotterels are showing an interest. Start machinery periodically (at least daily) as banded dotterels can habituate to inoperative machinery left for extended periods of time.
Impenetrable surface	High	Convert suitable nesting habitat to unsuitable by making surfaces impenetrable (i.e., paved surface), as banded dotterel will not be able to excavate small scrapes in the ground to construct nests.

Additional Security for Silt Fencing

As Moa Point is subject to high winds and adjacent to an active runway, the following methods are recommended to provide additional security to any silt fencing erected on site:

- Silt fences should be low (~20¹²-30 cm) to reduce wind resistance;
- Silt fences should be angled to suit the prevailing wind and reduce wind resistance;
- The silt fence posts should be positioned close together (~1.5 m apart) to increase stability;
- Reinforced with wire backing behind the material, as well as on the top; and
- The bottom edge of the silt fencing material can be held down or buried with soil/materials to prevent upward lift.

Alternative materials can be used, as described in Table 9. Key points to consider are height, resistance to withstand high winds (heavy), and also not creating new platforms for birds to nest on top of.

4.2 Pre-construction nest surveys

At least 24 hours prior to the initiation of construction, by a suitably qualified experienced person (SQEP) such as an ornithologist and/or ecologist must carry out a visual inspection of the site to identify if banded dotterels/variable oystercatchers are nesting, during the breeding season. This survey should be carried out at the southern extent of the airport runway at Moa Point and within Moa Point beach coastal habitat (Figure 5), and the MGC yard area.

The initial inspection will be undertaken through a systematic survey of the site using binoculars from a high vantage point, preferably near the site perimeter, combined with an aural survey for bird calls. Conducting the inspection from outside the site aims to minimise disturbance to any potentially nesting bird/s during the initial assessment. If no dotterel or oystercatcher nests are identified, a systematic walk-through of the entire works area may then be undertaken at a slow and deliberate pace, scanning the ground carefully for eggs.

As dotterel are highly camouflaged within their surroundings, there is a risk that individuals or nests may be missed during the initial vantage survey, so care should be taken whilst walking through the site. If dotterel or oystercatchers are discovered on site during the walk through, and exhibit alert behaviours towards the SQEP, such as a broken-wing display (Photo 3), this likely indicates the presence of a nearby nest or breeding birds. In these circumstances, the SQEP should withdraw from the area and observe the birds from a sufficient distance to avoid further disturbance. This allows the birds to resume normal behaviour and, if nesting, return to their nest. If nests with eggs are detected on site, the protocol within the section 4.3 below should be adhered to.

Should birds be present, but not have nests, weekly inspections should be conducted during construction to monitor for the presence of dotterel pairs, breeding territories and potential new nests. Deterrence measures can be used if birds are detected but are not found to be breeding.

An additional site inspection may be necessary if the site remains inactive for more than 3 days.

4.3 Eggs detected on site

If eggs are found on site (i.e. eggs laid in a nest) within the construction zone, the following steps apply:

¹² Banded dotterels are about 20cm tall (<https://www.nzbirdsonline.org.nz/species/banded-dotterel>), so this is the minimum height to ensure standing dotterels are not able to see above fences.

- All activities within 50 metres of the nest should stop immediately and people are to leave the area. A 50 m buffer around a nest is required as recommended by McVeagh and John (2020). They concluded that a 50 m buffer was necessary around nesting banded dotterels because trials showed nests were not disturbed by machinery until vehicles were as close as 40 m, while the 50 m distance from chicks needed to be maintained due to their greater vulnerability and difficulty of detection. This same distance is also used for New Zealand dotterels in construction sites too. (Bannock, 2012).
- Do not directly mark the nest location. If needed a marker can be placed at least 10 metres from the nest as an indicator, or two markers either side >10 m from the nest.
- Notify the Project Ornithologist (refer Table 2).
- Depending on the nature of the job (duration, disturbance level), weather, and the individual birds it may be possible to undertake some tasks near a dotterel nest. Such tasks will be at the discretion of the Project Ornithologist taking such variables into consideration. Weather is a key factor, as adverse weather may affect exposed eggs when parents are disturbed and off the nest. Because of this, decisions on whether to proceed are to be made the day work is to be carried out. This reduces the risk of unexpected bad weather negatively impacting upon dotterel eggs or chicks. Limit the time that a pair of dotterels are disturbed (i.e. any activity that causes alarm in the birds, including incubating birds leaving their nest) or to 30 minutes in normal conditions, 10 minutes at the most in cold and hot conditions. Rain is particularly dangerous to eggs and young chicks. If it is raining postpone the monitoring or nearby activity until conditions are more suitable.
- If the nest is located in an area that will not be affected by works, then the area can be cordoned off using tape and markers. The area should be at least 10 m x 10 m in size with the nest situated in the middle. Make it clear that no person or machine is to enter the marked-out site. No work is to occur within 50 m of the nest unless it has been discussed with an ecologist and approval given.
- If the nest is in an area that has to be worked within the next 32 days, this must be discussed with the Project Ornithologist. Actions such as moving nests are extremely risky and unlikely to succeed, and therefore, not preferable.
- If there is a risk of chicks entering into construction areas after they hatch, chick fences (i.e. waratahs and shade cloth or other material) can be constructed (50+ metre radius from the nest), as a precautionary separation measure between birds/chicks and construction and roading areas.
- Monitoring equipment (i.e. trail camera) will be positioned at each dotterel nest site within the works area to monitor for any potential adverse effects, and to ensure compliance with the above requirements. This footage will be reviewed by the Project Ornithologist/ecologist weekly.

4.4 Chicks Found in the Construction Area

If chicks are found in a work area and are at risk, there are a few potential options to avoid impacts. One of the following options will be implemented, in consultation with the Project Ornithologist:

- Delay work until the chicks have fledged (5-6 weeks for banded dotterels and 5-7 weeks for oystercatchers, post-hatching).
- Delay work until the parents move the chicks from the work area. Chicks are mobile from a young age (1-2 days after hatching). Parents may move from the nesting area at night following disturbance. Ensure chicks are not trapped or boxed in an area.
- Monitor chick location each day during construction to reduce risk of chick injury or mortality. Young chicks (2-10 days) will tend to hide when disturbed, whereas older chicks will tend to flee.
- Mobile chicks can be herded to a safe area, i.e. outside the construction yard where they won't be trampled or run over/disturbed by machinery. This is the least preferred option and should only be done if chicks will not leave the area on their own accord. An experienced ecologist should conduct the herding, and it should always be done in full view of the parents. Herding is also age (>10 days) and weather dependent. Regular checks for chicks prior to construction should be conducted each morning in affected areas.

4.5 Minimising impacts on breeding birds

Should active nests of ground-nesting species (e.g., banded dotterels) be located within the airport grassland area (Figure 6), additional provisions are recommended, as per the EclA (Bioresearches, 2025). These will improve the survival chances for active nests and chicks.



Figure 6. Airport grassland habitat where refuge provisions are recommended for banded dotterel, and historic records of banded dotterel utilising this area during the breeding season.

Nest Cages

Three pairs of banded dotterels 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 aim to protect eggs and incubating birds from any large predators (cats, gulls, harriers) with the following materials and methods (shown in Figure 8- Figure 9):

- 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;
- The cage is put over the nest, pushing the bottom rebar into the ground for stability;
- Installed within the airport grassland;
- One nest cage should be provided for per pair, for three pairs of dotterel that have successfully laid nests on the airport grassland;
- Nest cages should be installed within 48 hours of the nest (containing at least one egg) being discovered;
- The cage should be constructed based on the above guidelines however it can be adapted where necessary to ensure nest cages do not pose a foreign object debris risk to the Airport, or to prevent larger predators (i.e., cats, harriers) from entering the cage, whilst still allowing space for dotterel to enter/exit. The rebar corners are designed to enter the ground, reducing the open space and preventing large predators from entering.

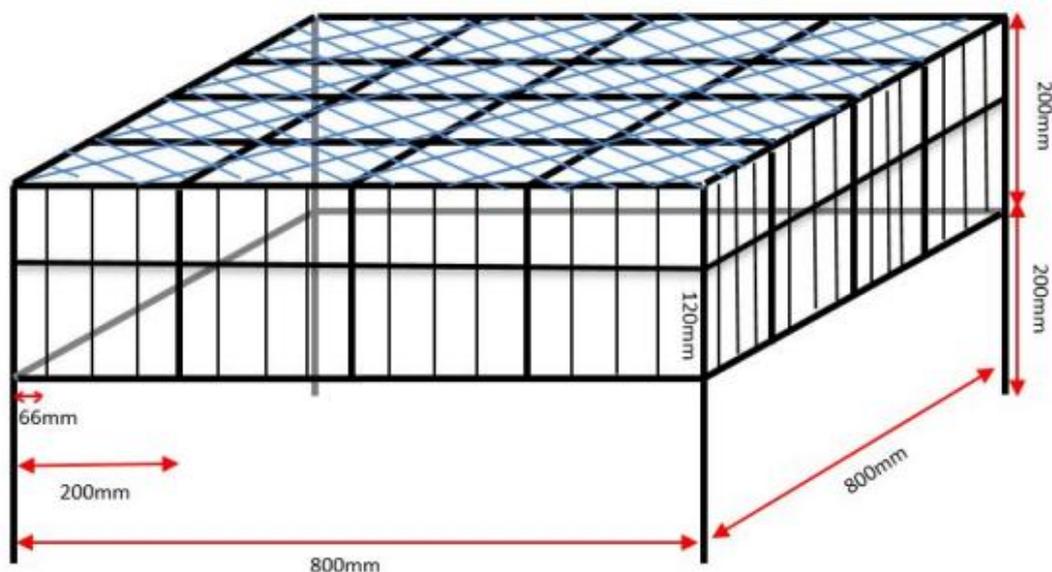


Figure 7. Recommended dotterel nest cage construction.



Figure 8. Nest cage construction example,
photo from
<https://www.braideddrivers.org>

Figure 9. Banded dotterel nesting within a nest cage.

Refuge Huts

If chicks hatch successfully within the airport grassland area, three clutches of banded dotterel chicks should be provided with a refuge hut (one per clutch). Refuge huts (Figure 10) for chicks will provide shade and refuge increasing survival chances (Butcher et al, 2007). These should be constructed and implemented using the following methodology:

- Wood (i.e., plywood), measuring >30 cm x 30 cm, with an internal brace supporting the connecting panels;
- 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; and
- Huts should remain on site until the chicks have successfully fledged, or have not been detected on Site for over one week.

Refuge huts should be constructed based on the above guidelines; however they can be adapted as necessary to ensure nest cages do not pose a foreign object debris risk to the Airport.



Figure 10. Chick refuge huts (wooden tepees) to provide a refuge for chicks and protection from aerial predation (Photo from <https://www.Birdlifeaustralia>).

5 TERRESTRIAL AVIFAUNA BREEDING MANAGEMENT

5.1 Kārearea

Although kārearea have not been recorded breeding on site, pairs have bred ~1 km east of Miramar Golf Course (Eastern Track, Beacon Hill Road) for three consecutive years. Falcons nest in simple ground scrapes with varying cover (e.g., fallen trees, shrubs), and suitable breeding habitat is present adjacent to the MGC Yard within Tukanae Reserve. The upper embankment, with established canopy, fallen logs, and shrubs, offers higher suitability than the lower embankment, which consists mainly of younger plantings and rough grassland (Figure 12).

Management measures are included to avoid direct and indirect disturbance during construction. Kārearea are highly aggressive near nests and will dive-bomb intruders; such behaviour typically indicates a nest within 50–100 m, requiring immediate withdrawal to prevent injury and nest abandonment.

The *New Zealand Falcon Management Guide for Plantation Forestry* (NZMGPF) recommends a 200 m exclusion zone in plantation habitats. However, urban-breeding falcons- often in reserves with regular human activity- are likely more habituated to human disturbances. A reduced 100 m exclusion zone is therefore recommended, consistent with NZMGPF allowances. In urban areas, nest management typically involves track closures and signage for the nesting period to minimise disturbance and warn of potential aggression.

Given limited research on the effects of construction on urban-breeding kārearea, an adaptive management approach is advised. Protocols are outlined in the following sections and summarised in Figure 13.

5.1.1 Pre-Works Nest Survey

Should site establishment works occur during the breeding season (August-March inclusive), a nest survey should be conducted by an experienced ecologist or ornithologist at least 24 hours before construction to determine if falcons are nesting within 100 m of the yard boundary. If the yard is already established, a survey should be undertaken at the start of the breeding season (August). Once in place, the yard is less likely to disrupt kārearea in subsequent years, as it will already be present during territory establishment and nest building.

If no birds are present or showing breeding signs, MCG Yard activities and ongoing operations can proceed as normal. Any notable activity, such as regular sightings or dive-bombing, between August and March must be reported to the Project Ornithologist within 24 hours.

Breeding indicators include:

- Courtship in early spring, with aerial displays and food transfers from male to female.
- Loud defensive *kek-kek-kek* calls within a few hundred metres of a nest.
- Dive-bombing behaviour, typically indicating a nest within 50–100 m.

If a nest is confirmed within 100 m of the yard boundary, the nest management protocols in the following section will apply.

5.1.2 Nest Management Protocols

Establish a buffer zone: A 100 m (line of sight) buffer zone should be implemented from the kārearea nest for the whole time that the eggs and chicks are in the nest (approx. 75 days) (see Figure 11 and Figure 12). This applies to the establishment of the MGC Yard and ongoing operations.

Demarcate Nest: A buffer of 100 m (or a smaller buffer determined as per the above process) from the nest should be demarcated using tape and markers.

Limit Activities: MGC Yard activities within the buffer should be limited to those activities using machinery where practicable¹³, however foot traffic is permitted for essential work, with groups of three or less for no longer than 15 minutes.

Monitor Nest: Monitoring of kārearea will be undertaken by an ornithologist and/or ecologist for 1-3 days at the beginning of works to assess activities on Site and any potential disturbances.

5.1.3 Adaptive Management

Where operational constraints make a 100 m buffer unworkable, the buffer can be reduced to up to 50 m at the discretion of the Project Ornithologist and only where there is no disturbance or impact to kārearea.

Additional activities may be permitted where disturbance is not observed. This will be at the discretion of the Project Ornithologist after monitoring and review of breeding kārearea during such activities.

If disturbance to kārearea is observed (i.e. leaving the nest for extended periods, dive-bombing, screeching), activities and buffer distances will be reviewed by the Project Ornithologist and may be adapted to minimise disturbances to kārearea.

No additional work is to occur within the constraints area unless it has been discussed with the Project Ornithologist and approval given.

The nest should remain undisturbed and monitored until fledging or nest abandonment is confirmed. Weekly monitoring inspections of any nest and/or chicks on site, or within buffer areas, by a SQEP should be undertaken until the completion of nesting and fledging as further described in Section 7.

¹³ Research on other species, such as banded dotterel, has shown different flight initiation responses between human approach and vehicle approach, allowing machinery to approach ~10-30m closer compared to a human approach, before the birds are flushed from their nest (McVeagh and John, 2020).

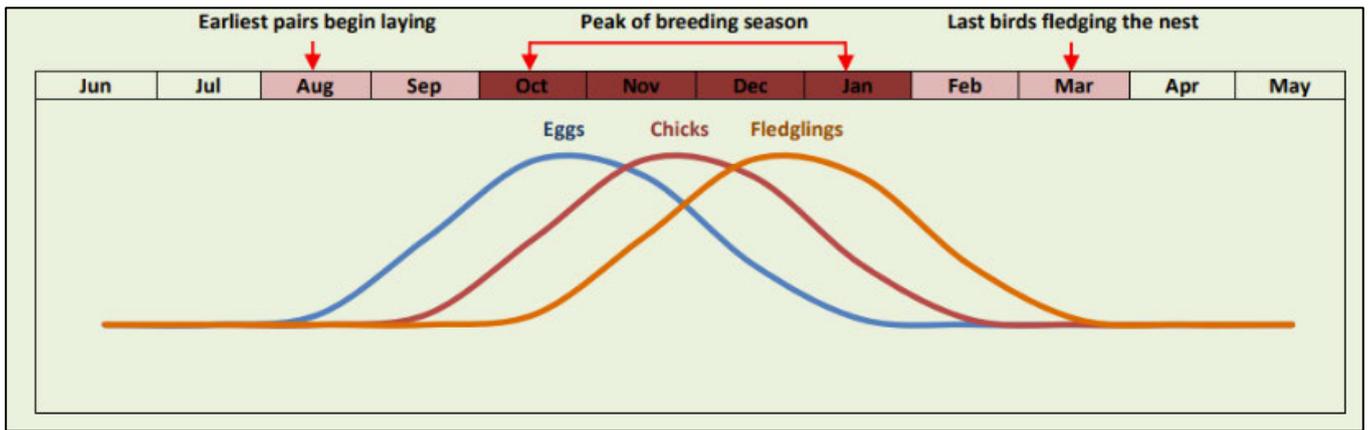
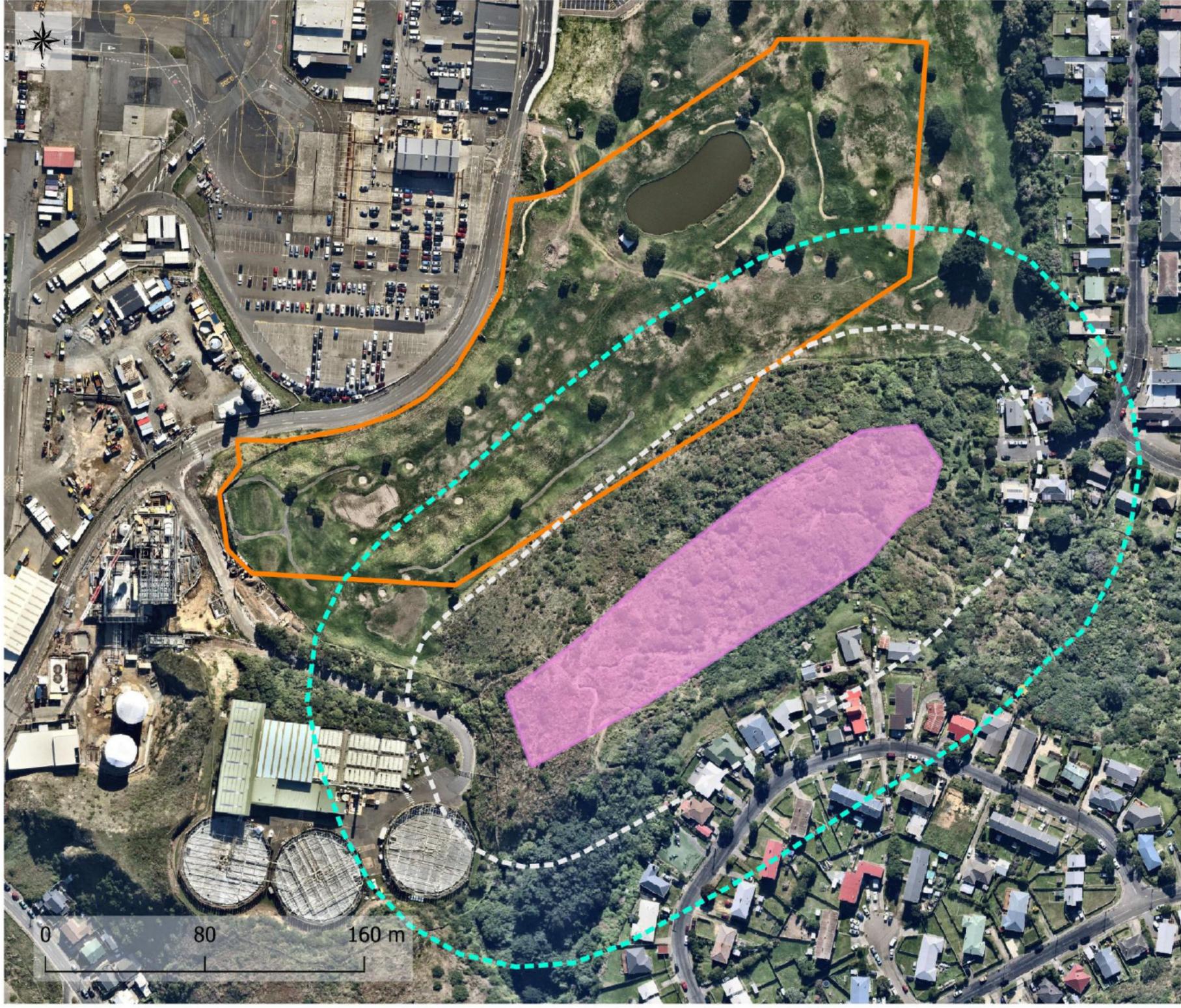


Figure 11. The New Zealand falcon/ kārearea breeding season, with details about occurrence of egg laying, chicks and fledglings¹⁴.

Figure 12. (following page) 50 m-100 m buffer zone from the indicative potential habitat identified within the Tukanae Reserve.

¹⁴ Figure sourced from New Zealand Facon Management Guide: Plantation Forestry. <https://www.wing-span.co.nz/PDF/Forestry-Management-Protocols-final.pdf>



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**Breeding karearea buffer
zone and indicative nesting
habitat**

Legend

- - - 100m falcon buffer - potential habitat
- - - 50m buffer - potential habitat
- MGC Yard Boundary
- Potential karearea breeding habitat within 100m of MGC yard

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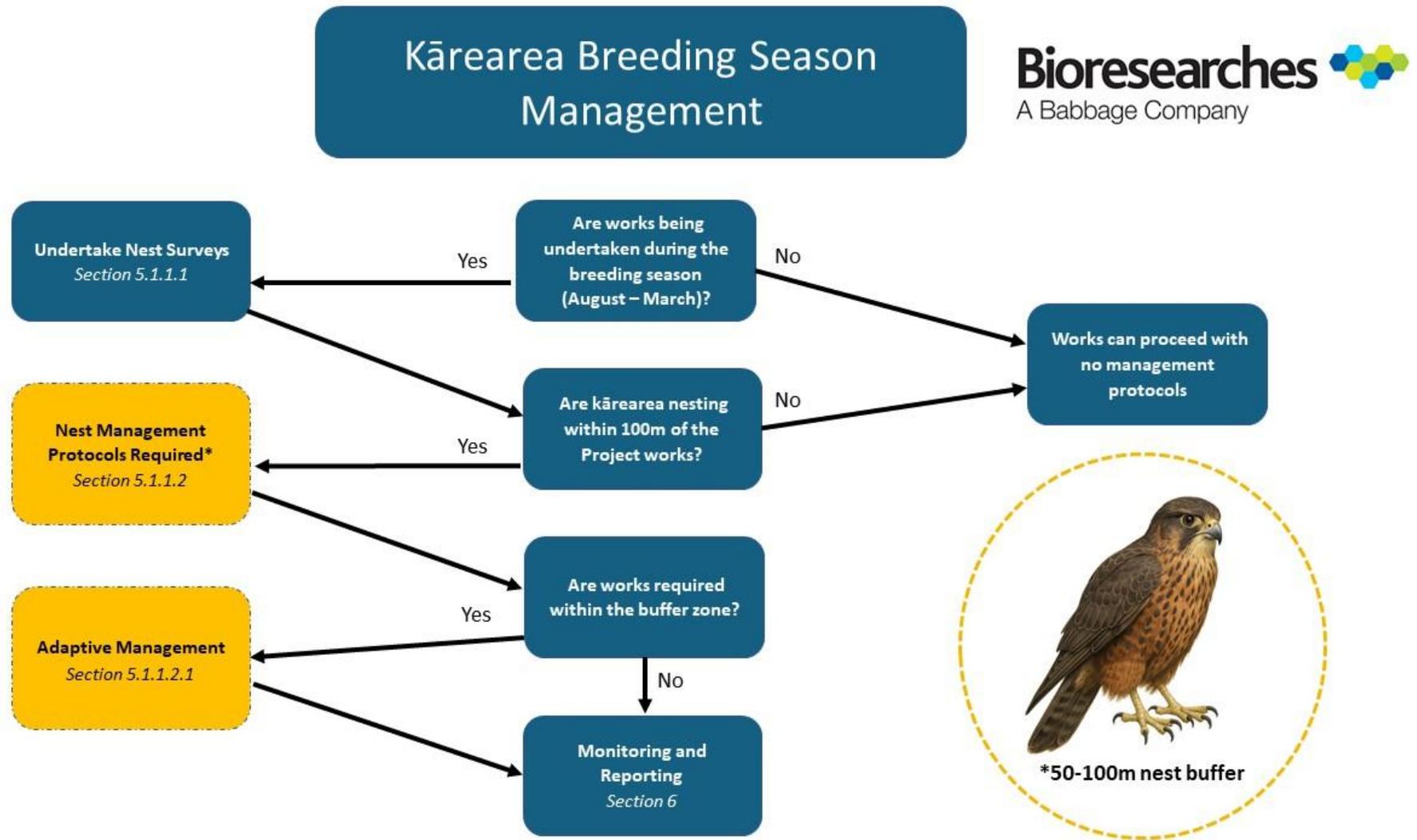


Figure 13. Kārearea breeding season management protocols

5.2 Forest birds

To avoid potential delays to the proposed works, vegetation clearance and tree felling is recommended to be undertaken prior to the avifauna nesting season (provided in Table 8). If vegetation clearance is required during the breeding season, the following protocol should be adhered to. These protections are recommended for forest birds (as provided in Section 2.2, Table 8), and apply to native species only:

- Vegetation clearance during the bird breeding season (provided in Table 8) should be preceded by a nest check by a suitably qualified and experienced ecologist or ornithologist;
- A bird nesting check should also be undertaken no more than 24 hours prior to tree felling (e.g., morning before, or morning of). If tree felling occurs outside of the breeding season for native forest birds, nest checks for these species are not required;
- Nest checks are best undertaken in the morning when birds are most active, however can be undertaken at other times of the day;
- Nest checks should include both the branches, foliage, and cavities of standing trees, as well as the ground and any groundcover/rank grass habitat;
- Where a nesting bird and/or eggs are detected, all operations will cease within 20 m of that nest until the Project Ornithologist has confirmed that the nest has either failed or the chicks have fledged (noting that this potential constraint can effectively be avoided by felling trees outside of the breeding season);
- The nest location should be visibly marked by the Project Ornithologist (e.g., spray paint on nearby tree, flagging tape), and a map/GPS location provided to the Site Manager to be available to all contractors. The 20 m radius should also be marked, either on a map or ideally with spray paint;
- The nest would be monitored until the chicks have fully fledged (i.e. can leave the nest of their own accord) and are capable of dispersing the site independently, or until the nest is confirmed failed. Vegetation clearance or felling can occur once the nest is determined to be inactive, and the parents have not re-nested in the same vegetation;
- If a nest is discovered outside of the nest check, the Project Ornithologist should be contacted immediately and works must cease within the 20 m radius of the nest. Photos should be provided where possible, as well as location; and
- The Project Ornithologist will notify the Site Manager and Contractor responsible for vegetation clearance upon completion of the survey and advise on the location of any nesting native birds.

6 GROUNDED SEABIRD MANAGEMENT

6.1 Fluttering shearwaters

Fluttering shearwater (*Puffinus gavia*) is an endemic seabird listed as At Risk – Relict under the New Zealand Threat Classification System (Robertson et al., 2021). This small Procellariiform breeds colonially on predator-free islands throughout the North Island and northern South Island, including Matiu/Somes Island approximately 10 km north of Wellington Airport.

Fledglings emerge from colonies during January–February, when they are highly susceptible to disorientation and grounding from artificial light at night (ALAN). These young birds are attracted to high-intensity, short-wavelength (blue-white) light, and can be grounded up to 15 km from colonies under overcast or low-moon conditions (Rodríguez et al., 2014; Heswall et al., 2022).

The Ecological Impact Assessment for the Southern Seawall Renewal Project identified numerous records of fluttering shearwaters within Wellington Harbour and Lyall Bay, particularly post-breeding when juveniles disperse from Matiu/Somes Island. The Project area lies within the typical fallout range for fledglings, especially when artificial lighting is used during night construction works at Moa Point and the Eastern Bank.

Given the Project's temporary lighting towers, vehicle headlights, and security lights, fledgling grounding events are considered possible during the January–February fledging period. The primary pathway of effect is light-induced disorientation, not physical habitat loss or noise disturbance.

6.2 Management Actions

The management of grounded seabirds at the Southern Seawall Renewal Project focuses on preventing light-induced disorientation of fluttering shearwaters and ensuring appropriate response and welfare measures if grounding occurs. The objectives are to minimise artificial light attraction during the fledging season, protect any grounded birds, and apply adaptive management if multiple incidents are recorded.

Artificial lighting is recognised as the primary factor contributing to seabird fallout events. To minimise this risk, construction lighting during night works must be carefully managed in accordance with EclA recommendations and national light pollution guidelines. All lighting used within the project footprint, including temporary task lighting, security lighting, and vehicle headlights, should be designed to limit intensity and glare. Lights will be fully shielded and directed downward to prevent spill toward the sea or sky. The use of warm-spectrum light sources (with a correlated colour temperature of 3000 K or lower) is required, as these emit less blue light that attracts fledgling seabirds. Where practicable, motion sensors, timers, or dimming controls will be employed to ensure lighting is active only when required for safety or operational purposes.

Seasonal restrictions will apply to align with the fluttering shearwater fledging period. Enhanced light management protocols will be in effect from 1 January to 28 February, when fledglings are most vulnerable to disorientation, with an extension to 15 March if grounding events are observed. During periods of poor visibility, such as overcast or low-moon nights, the project team will further reduce lighting levels and, where possible, limit work to essential activities only.

All personnel involved in night works will receive annual training in seabird identification and response procedures through a January induction session. This will include recognition of grounded seabirds, safe

handling techniques, and notification requirements. A dedicated “Grounded Seabird Kit” will be maintained at the site office and within the night supervisor’s vehicle. The kit will contain ventilated cardboard boxes, soft towels, nitrile gloves, red-filter torches, and log sheets for incident recording.

If a seabird is discovered grounded, the nearest staff member must immediately reduce or switch off nearby lighting to prevent further stress to the bird. The bird should then be approached calmly and captured using a towel or soft net, taking care to avoid damaging feathers or wings. Once secured, the bird is to be placed in a dark, quiet box and the Project Ornithologist (Michael Anderson) contacted without delay. Birds that appear uninjured will be released after dark at a suitable coastal location away from artificial lights, under the supervision of the Project Ornithologist. Injured or exhausted birds will be transferred to the Wellington Bird Rehabilitation Trust (WBRT) or the Department of Conservation (DOC) via the emergency wildlife hotline (0800 DOCHOT).

If more than one bird is found grounded within a week, the Project Ornithologist must be notified immediately and an adaptive response initiated. This will include a lighting audit, assessment of illumination levels and direction, and review of the lighting layout or work schedule. Corrective measures may include additional shielding, further dimming of lights, or temporary suspension of night works until the issue is resolved.

To support rapid and consistent implementation, a concise “Grounded Seabird Quick Card” will be issued to all site personnel. This card will summarise the identification, handling, and notification process, as well as key contact information and safe release procedures.

6.3 Monitoring and Reporting

Monitoring and reporting are essential components of the grounded seabird management framework, ensuring that the effectiveness of mitigation measures is verified and that any required adaptive management actions are implemented promptly. Monitoring will focus on three primary areas: night-time patrols, lighting audits, and incident documentation.

During the peak fluttering shearwater fledging season (January to February, and extending to mid-March if required), night patrols will be undertaken across all areas where artificial lighting is in use. Patrols will occur at least hourly throughout the night shift, increasing to every thirty minutes under adverse conditions such as overcast, drizzly, or windy nights when light disorientation risk is elevated. The patrol routes will include all active construction zones, laydown areas, and the coastal margins adjacent to the seawall and Moa Point Road. Any grounded seabirds observed will be managed in accordance with the response procedures outlined in Section 6.2.

Lighting audits will be carried out monthly during the risk period to confirm compliance with design and operational standards. These audits will measure illumination levels (in lux) along the boundaries of the site, including the coastal edge, to ensure light spill remains minimal. Particular attention will be given to any new or modified lighting installed for construction activities. Where non-compliance or excessive light spill is identified, corrective action will be taken immediately, such as adjusting fittings, adding shields, or reducing light intensity. The Project Ornithologist will oversee the audit process and record all results in a central compliance log.

All seabird incidents must be documented in detail. Records will include the date and time of discovery, weather and light conditions, the location of the bird, and the observed condition (e.g., uninjured, injured, deceased).

Details of any handling, transport, or release will also be recorded. Each incident will be photographed where appropriate, without the use of flash photography, to support verification and reporting requirements.

A summary of all grounded seabird incidents and patrol activities will be prepared weekly and submitted to Wellington International Airport Ltd (WIAL), Greater Wellington Regional Council, and the Department of Conservation. These weekly reports will also note lighting compliance checks, any deviations from standard operating procedures, and any remedial actions undertaken.

At the conclusion of each fledging season, the Project Ornithologist will prepare a concise post-season report. This report will summarise patrol effort, lighting performance, incident frequency and outcomes, and the overall effectiveness of the implemented mitigation measures. Where patterns or recurring issues are identified, recommendations for adaptive improvements will be included. The report will form the basis for annual review meetings with WIAL and the construction management team, ensuring that the lessons learned are incorporated into future phases of the project.

The monitoring and reporting framework will operate under the principle of continual improvement. Findings from each season will inform refinements to lighting design, site operations, and training. This approach ensures that grounded seabird management remains responsive to environmental conditions and achieves its objective of reducing light-related impacts on fluttering shearwaters and other seabirds within the Wellington Airport project area.

6.4 Grounded Seabird Response Protocol — Site Workers

Purpose: To provide clear, simple steps for responding if a seabird (e.g. fluttering shearwater, petrel, penguin) is found grounded, injured, or disoriented within the construction site.

1. Stay calm and keep the bird safe

- Approach slowly and quietly.
- Do **not** chase, corner, or try to make the bird fly.
- Avoid loud noise, shouting, or bright torches directed at the bird.
- If possible, turn off or dim nearby lights to reduce glare and stress.

2. Notify immediately

Contact the following in order of priority:

1. Project Ornithologist: Michael Anderson – [REDACTED]
2. Environmental Site Supervisor or Site Foreman – via radio or mobile.
3. If after hours or unable to reach site contacts:
 - Wellington Bird Rehabilitation Trust (WBRT): 027 449 4049
 - Department of Conservation (DOC Hotline): 0800 DOCHOT (362 468)

Tell them:

- Your name and role
- The location of the bird (mark if possible)
- The time found, and lighting/weather conditions
- Whether the bird appears injured or exhausted

3. Capture the bird safely (only if trained or instructed)

- Put on gloves from the *Grounded Seabird Kit*.
- Gently place a towel or soft cloth over the bird to calm it.
- Lift the bird carefully using both hands, supporting the body and wings.
- Do not hold by the legs, wings, or tail.
- Place it in a ventilated cardboard box lined with a towel (“Seabird Box”).
- Keep the box in a quiet, dark, sheltered spot such as the site office or supervisor’s vehicle until help arrives.

If the bird is injured, do not attempt to provide food, water, or medical care. Wait for direction from the Project Ornithologist, DOC, or WBRT.

4. Do not attempt to release the bird

Only an authorised wildlife rehabilitator should assess when and where the bird can be safely released. Birds may appear recovered but can quickly become exhausted if thrown or forced to fly.

5. Record the incident

Complete a Grounded Seabird Incident Form from the site kit. Include:

- Date and time
- Exact location (GPS or nearest site feature)
- Weather and lighting conditions
- Bird description and condition
- Actions taken and who was contacted

Submit the form to the Environmental Site Supervisor before the end of your shift.

6. Key contacts

Role	Contact	Notes
Project Ornithologist – Michael Anderson	[REDACTED]	Lead contact for all seabird incidents
Wellington Bird Rehabilitation Trust (WBRT)	0508 NZ BIRD (0508 69 2473)	24/7 seabird and wildlife rescue
DOC Hotline (Emergency Wildlife)	0800 DOCHOT (362 468)	24/7 national wildlife line
Environmental Site Supervisor	TBC	On-site environmental coordination

7. Quick Reminders

- Grounded seabirds are protected under the Wildlife Act 1953.
- Never attempt to “help” by throwing or tossing a bird into the air.
- Most seabird fallout occurs in January–February, especially on dark or cloudy nights.
- Treat all wildlife with care and respect—report first, handle only if authorised.

If in doubt — stop work in the immediate area, keep the bird safe, and call for help.

7 MONITORING AND REPORTING

Ongoing monitoring is required to ensure compliance to the above conditions is met, and the outcomes are achieved as set out in Section 1.2.

Should construction be found or suspected to adversely affect breeding avifauna on site, the Project Ornithologist may implement additional mitigation and/or monitoring strategies at their discretion, to ensure there is no impact on the breeding success of avifauna by the proposed activities. This will be discussed with the client prior and only implemented where necessary.

7.1 Weekly monitoring of the works area during the breeding season

Weekly monitoring of the works area should be undertaken to provide early warning to management if breeding pairs are prospecting territories within a works area and implement deterrence methods to ensure nest attempts or chicks within the works zone are avoided. See Section 3 and Section 4 for recommended methods.

Deterrence options (Table 9) are encouraged to prevent shorebirds from establishing nests within the Moa Point works area, and vegetation clearance prior to the forest birds' breeding season (see section 4.1.2) to prevent delays and impacts to construction works.

7.1.1 Weekly monitoring of nesting birds

If birds are found nesting on site, ongoing site visits and surveys will be required to ensure there is no impact on the breeding success of avifauna by the proposed activities. This will include the following management provisions:

1. Weekly monitoring inspections of any nest and/or chicks on site, or within buffer areas, by a SQEP, such as an ornithologist and/or ecologist, until the completion of nesting and fledging. Where inspections are not undertaken by a SQEP from Bioresearches, an SQEP should be approved by the Project Ornithologist.

Monitoring will include:

2. Positioning monitoring equipment (i.e. trail camera) at each nest site within the works area. This footage will be provided to Bioresearches by WIAL and reviewed by the Project Ornithologist/ecologist weekly. The monitoring equipment (including trail cameras and SD memory cards will be provided by Bioresearches); and
3. Weekly site visits by a person appointed by the Project Ornithologist, monitoring the nests with binoculars from outside the specified buffer zones. If undertaken by an appointed person, the inspection reports should outline the weekly inspection findings to the Project Ornithologist within 24 hours of inspection, or an alternative reduced frequency when birds are not found to be present on site, as approved by the Project Ornithologist.

7.2 Daily monitoring of shorebird chicks

Should a nest be present and chicks have hatched, additional monitoring will be required. If it is feasible for work to continue, the location of shorebird chicks should be checked every day within the works area, both before construction and during construction. This is necessary to reduce the risk of shorebird chick injury or mortality.

7.3 Site vacant for extended periods

Should the site be inactive for more than 48 hours (e.g. long weekends, Christmas holidays, site shutdowns), an additional inspection is required before work on the site recommences. Shorebirds, such as dotterels, are known to take advantage of quiet construction sites and construct nests and lay eggs within a very short window of opportunity.

7.4 Reporting

A completion report will be provided by the Project Ornithologist to WIAL at the end of each breeding season during construction. 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.

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