



Te Ara Ki Mua i Ngā Kororā | Kororā Management Plan

State Highway 1 Wellington
Improvements

Prepared for
New Zealand Transport Agency | Waka Kotahi

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1 Introduction

1.1 Background

The State Highway 1 (SH1) Wellington Improvements project (the Project) is a Road of National Significance (RoNS) which improves SH1 in Wellington City. The proposal includes the construction of, or improvements to, SH1 within Wellington City, extending over 5 km through the city. The Project will provide for more efficient and reliable access on SH1 and includes duplicate tunnels at The Terrace and Mount Victoria, a new layout at the Basin Reserve as well as improvements along the remainder of the SH1 corridor from north of the Terrace Tunnel to the intersection of Cobham Drive and Evans Bay Parade. The Project aims to attract traffic onto SH1, reduce traffic on other key routes, unblock critical bottlenecks on the State Highway, maintain access for local movements and enable public transport growth.

The Project construction will also include a replacement stormwater outfall into the coastal marine area to accommodate for the upgraded flow discharge into Evans Bay. The works for the upgrade will likely include:

- Removal or partial demolition of the existing outfall structure.
- Installation of a new outfall pipe and connection to the upgraded stormwater network.
- Construction of new inlets, chambers, or pipework to tie into upstream drainage infrastructure.
- Installation of erosion protection at the outfall interface, such as rock armouring, energy dissipation structures or geotextile matting.

This Kororā Management Plan (KMP) relates solely to these works; for the purposes of this KMP the Evans Bay outfall works area is the 'Project site'.

This KMP refers to the Project site and the associated 'zone of influence' (ZOI),¹ the relocation / release site for kororā, and the location for compensation actions (nest box placement, planting and fencing). For ease of reference these locations are shown on Figure 1.1 and Figure 1.2.

¹ The ZOI for potential noise effects on kororā is defined as 20 m in all directions from the edge of the works footprint, calculated from the expected setback to achieve compliant noise management for kororā without noise barriers. See Figure 1.2 and Figure 3.1 and section 3.4.4



Figure 1.1: Project site, showing outfall location and areas of direct impact to kororā habitat.

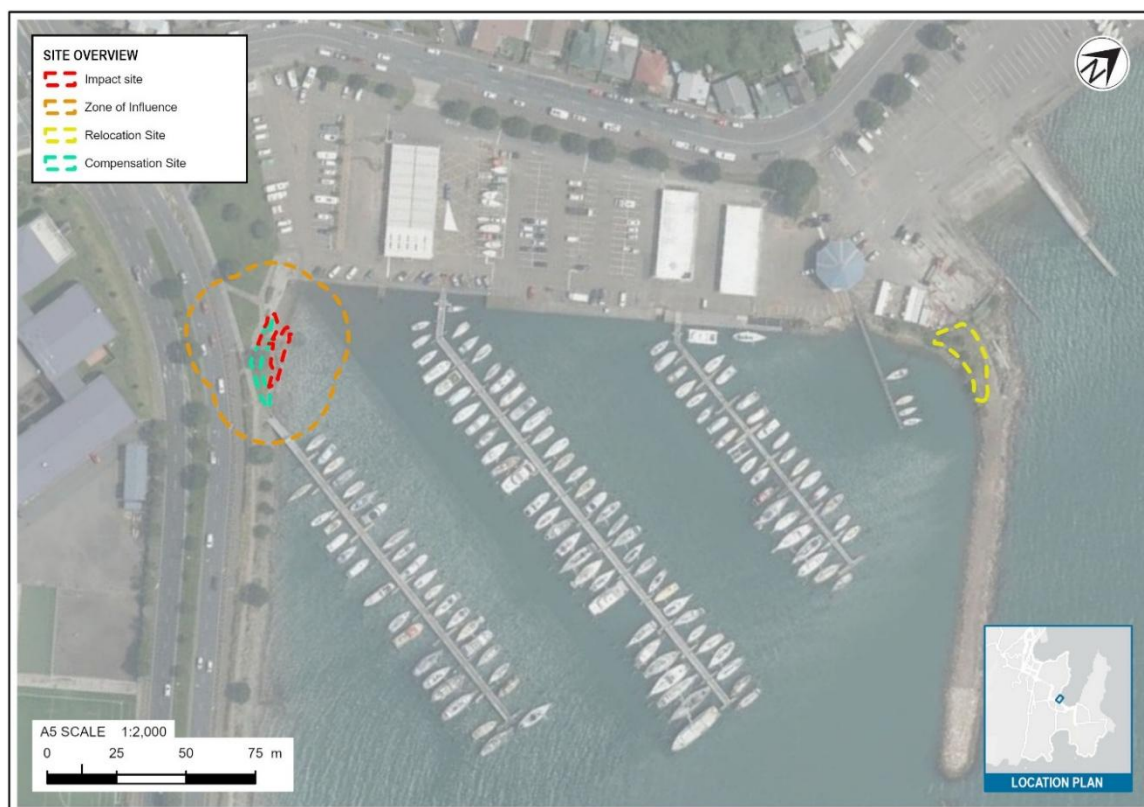


Figure 1.2: Overall plan showing the Project site, relocation area, and location for compensation actions.

1.2 Purpose and scope

The purpose of the KMP is to outline the methodology and protocols for managing kororā throughout the construction period², in order to avoid, minimise, and remedy effects on kororā arising from works. Because residual effects on kororā remain after effects management, this KMP prescribes methods to compensate for residual effects, with the goal of achieving no net loss of kororā values as a result of works.

This KMP details:

- Responsibilities of staff involved in kororā survey and relocation.
- Kororā ecological values.
- Potential effects to kororā due to the proposed works.
- Management measures to avoid, minimise, remedy and offset/compensate (where necessary) for adverse effects to kororā.
- Kororā relocation protocols.
- Relocation site characteristics and location.
- Monitoring and reporting requirements.

Kororā are protected under the Wildlife Act 1953. This KMP will be used to support a Wildlife Approval (WA) application within the Fast Track application, allowing the capture and relocation of kororā from the project footprint (if required).

1.3 Ecological context

Evans Bay is a shallow, U-shaped inlet located at the southern end of Wellington Harbour, bordered by the Miramar Peninsula and the suburbs of Hataitai and Kilbirnie. Historically connected to Cook Strait via the Rongotai flats, the bay spans approximately 3.6 km in length and 1.4 km in width, with a tidal range between 0.7 – 1.3 m. The bay has undergone significant modification, including the construction of a marina, boat ramp, stormwater outlets, and coastal infrastructure. Wetlands and sublittoral flats were lost due to reclamation. The stormwater outfall discharging into Evans Bay will be replaced or enlarged to accommodate for upgraded flows. The current stormwater outfall sits in the southwestern corner of the bay.

The Waipapa Stream, once a natural inflow, was piped between 1917 and 1935 and now serves as the stormwater outlet for the 126 ha Hataitai catchment. This urban catchment discharges into Evans Bay via the Evans Bay stormwater outfall, with flows ranging from 0.05 cumecs in dry weather to 8.5 cumecs during a 20-year storm event (EOS Ecology, 2013).

Above the outfall is a landscaped bank, with patchy, low-lying vegetation primarily consisting of *Muehlenbeckia australis* and *Disphyma australe*.

1.4 Statutory context

Legislation in New Zealand affords protection to native birds and their habitats. These include:

- National Policy Statement for Indigenous Biodiversity (NPS-IB) (Ministry for the Environment, 2023) the purpose of which is to maintain indigenous biodiversity across Aotearoa New Zealand so that there is at least no overall loss in indigenous biodiversity after the commencement date.

² The construction period refers to all works associated with construction. I.e from site investigations and set up, establishment works, through to the disestablishment of the site compound.

- Resource Management Act 1991 (RMA) which affords protection to significant habitats of indigenous fauna, including kororā.
- Wildlife Act 1953 which provides protection to most native bird species, including all threatened and at-risk species (kororā have a threat classification status of “At Risk – Declining” (Robertson et al., 2021)).

1.5 Resource consent and wildlife approval conditions

This KMP has been prepared in advance of resource consents and wildlife approvals being granted for the Project.

1.6 Responsibilities and competencies

Delivery of, and compliance with this KMP will be the responsibility of the Construction Site Manager who will liaise with a Suitably Qualified Ecologist (SQE) to implement this KMP. The SQE will oversee the implementation of the WA conditions.

It will be important for the Construction Site Manager to read and understand this KMP so that the protocols are adhered to correctly during construction works. Further responsibilities of personnel involved in the undertaking of works are outlined below (refer Table 1.1). Contractors, sub-contractors, and workers engaged in all activities covered shall adhere to this KMP.

Table 1.1: Summary of roles and responsibilities

Title	Responsibility	Contact
Project Owner (NZTA)	• Delivery of the Project, including compliance with any consent conditions, KMP and subsequent WA conditions to be issued for the project. • Stakeholder liaison and coordination (including mana whenua) and contractor management unless otherwise agreed.	
Construction Site Manager	• Reading and understanding the KMP so that the protocols are adhered to correctly during works. • Facilitating a project start-up meeting with the SQE before the works commence to determine habitats scheduled for clearance to enable forward planning and avoid delays in the construction schedule. • Briefing personnel that are involved in on-site activities about the responsibilities under this KMP, including works team, project engineers and contractors, prior to the start of works. • Toolbox talks to inform all the contractors on-site to avoid the location of the kororā habitat and to ensure that they know and understand the requirements of the KMP. • Liaising with the SQE 8 weeks in advance of vegetation removal or works within kororā habitat. • Undertake the necessary inspections of exclusion zones, fences and blockages to	To be confirmed after Contractor engagement.

Title	Responsibility	Contact
	ensure they are functioning as intended and to liaise with the SQE and reinstate as needed. • Contacting the SQE upon incidental discovery of potential kororā voids, kororā sign and any injured or dead birds.	
Suitably Qualified Ecologist (SQE)	• Training the onsite contractors to identify voids or gaps that kororā could utilise and any associated signs (i.e. Guano, feathers), secure work sites and what to do if a kororā is incidentally discovered during works. • Advising on the establishment and removal of exclusion zones around active kororā burrows. • Conducting pre-work surveys and determining if kororā burrows within the project area identified during pre-work surveys are active. • Making the final call, regarding when areas are clear of kororā and enabling or renewal works can commence. • Providing general kororā advice during enabling and renewal works. • Collection of kororā data pertaining to pre-work surveys, monitoring and relocation of birds. • To assess the suitability of the Relocation Site, advising on specific locations for nest box placement and providing input to nest box installation and fencing.	Joshua Forrest, BSc [REDACTED] Ândrea Westphal, MSc [REDACTED] Shannon Ritter, MWLM [REDACTED]
Mana whenua	• Providing input to the KMP to ensure mātauranga and tikanga are incorporated throughout the works. • Briefing personnel that are involved in on-site activities about the responsibilities under this KMP, including works team, project engineers and contractors, prior to the start of works. • Responsible for a cultural induction provided to contractors before physical works begin on-site. • In consultation with the SQE, respond to kororā mate (death), if ever found within the work site. • Shall be informed and given the opportunity to be on site with the SQE during the process of vegetation removal and demolition works.	Contacts to be confirmed.
Department of Conservation	• Ensuring compliance under the Wildlife Act (1953).	Local office: DOC Kapiti Wellington Office. 13b Wall Place, Kenepuru, Porirua, 5022. Phone: +64 4 470 8412.
Te Kōhanga, Wellington Zoo	• Providing veterinary care for injured native wildlife.	Wellington Zoo

Title	Responsibility	Contact
		200 Daniell Street, Newtown, Wellington 6021 Phone +64 4 381 6755

2 Summary of kororā values and effects

2.1 Kororā life cycle

Kororā / little blue penguins (*Eudyptula minor*) are native to both Aotearoa New Zealand and Australia and are the smallest of the 17 recognised penguin species. Kororā are distributed widely across New Zealand, with localised abundance in Rakiura, Ōamaru, Banks Peninsula, Kaikoura, Wellington, and Tauranga (Wilson, Mattern, & Waugh, 2019). Inconsistent search effort and controversy surrounding taxonomic classification means the New Zealand population is largely unknown (Taylor, 2000), but is conservatively estimated at 12,750 pairs (Robertson et al., 2021). The New Zealand threat classification status of kororā is At Risk – Declining according to the Department of Conservation (DOC) (Robertson et al., 2021).

Kororā are nocturnal on land, typically arriving ashore after dusk and departing before dawn (Bullen, 1997). Kororā exhibit high site fidelity (Gales, 1989), meaning individuals have a high tendency to return to the same nest sites as previous seasons, as well as any chicks that reach maturity, two years after they have fledged. Adults can be found on land all year round, with lower numbers typically between April-July after moulting and before the breeding season begins.

There are five main stages of the kororā breeding cycle:

- Burrow occupation which can occur all year round.
- Courtship, pair bonding, and nest building which marks the beginning of the breeding season.
- Egg laying and incubation.
- Chick rearing and fledging.
- Moulting, where adults are confined to land for 2 - 3 weeks to replace all their feathers.

After moulting adults return to sea and come ashore infrequently until the breeding season begins again. Kororā breeding and moulting season very much depends on food availability, meaning the breeding and moulting seasons will alter year by year (Fraser & Lalas, 2004).

Kororā within Wellington typically breed in loose colonies and are opportunistic when seeking refuge. Rock revetment, wooden nest boxes, native shrub, under houses and boat sheds, and culverts are all shown to provide suitable nesting sites. The largest colony of kororā in Wellington is on Matiu / Somes Island, with an estimated 300 - 500+ adults (Kinsky, 1959). Data from local Wellington populations indicates that the breeding season typically begins in June and runs until February (Bull, 2000).

Table 2.1: Indicative annual lifecycle of kororā in Te Whanganui-a-tara / Wellington (Bull, 2000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Burrow occupation												
Pair bond / nest building												
Egg laying												
Chick rearing / fledging												
Moulting												
Non-breeding / non-moulting												
Breeding												
Moulting												

For the purpose of the proposed works, the breeding and moulting season is defined as 16 June to 28/29 February. As many environmental factors can cause this season to fluctuate, ultimately a SQE will determine whether moulting or nesting kororā are present when authorizing works.

2.2 Kororā ecological values

The presence of kororā within the project footprint was assessed through the following methods:

- A desktop assessment of kororā presence in the landscape within and surrounding the project footprint. The desktop assessment consisted of reports provided by Wellington City Council (WCC) of previous kororā surveys by a certified protected species dog (Appendix A), previous monitoring and survey reports from 2023/2024,³ and from publicly collected observations on iNaturalist⁴.
- An on-site qualitative assessment of habitat values for kororā. This assessment focused on identifying suitable burrowing habitat and refuge opportunities such as cavities under dense vegetation, loose rip-rap, and artificial debris that may offer suitable refugia for kororā.
- A survey with a certified protected species dog (Figure 2.1). This survey focussed on confirming burrows within the zone of influence⁵, quantifying the use of those burrows, and assessing any potential pathways kororā use to access the site.
- A follow up visual inspection by an ecologist after the November 2025 certified protected species dog survey.

Through desktop assessments it was confirmed that kororā are found within the zone of influence (Figure 3.1). The qualitative assessment of habitat within the ZOI found that parts of the vegetated area proposed for clearance provides minimal opportunities for nesting and moulting, while the existing revetment provides potential sites suitable for the full life cycle of kororā.

The survey with the protected species dog indicates that kororā use this site routinely for roosting, though no evidence of nesting or recent moulting was observed (though evidence of moulting was observed in one burrow in the 2023/2024 surveys).

Based on the above assessments it is confirmed that kororā occur within the project footprint and are highly likely to be impacted by works.

³ Evans Bay Renewal Works – Kororā Compliance Report (2025). Prepared by Tonkin + Taylor on behalf of WCC

⁴ <https://www.inaturalist.org/observations> accessed 12 January 2026

⁵ Defined as 20 m in all directions from the edge of the works footprint, calculated from the expected setback to achieve compliant noise management without noise barriers – see Figure 3.1 and section 3.4.4

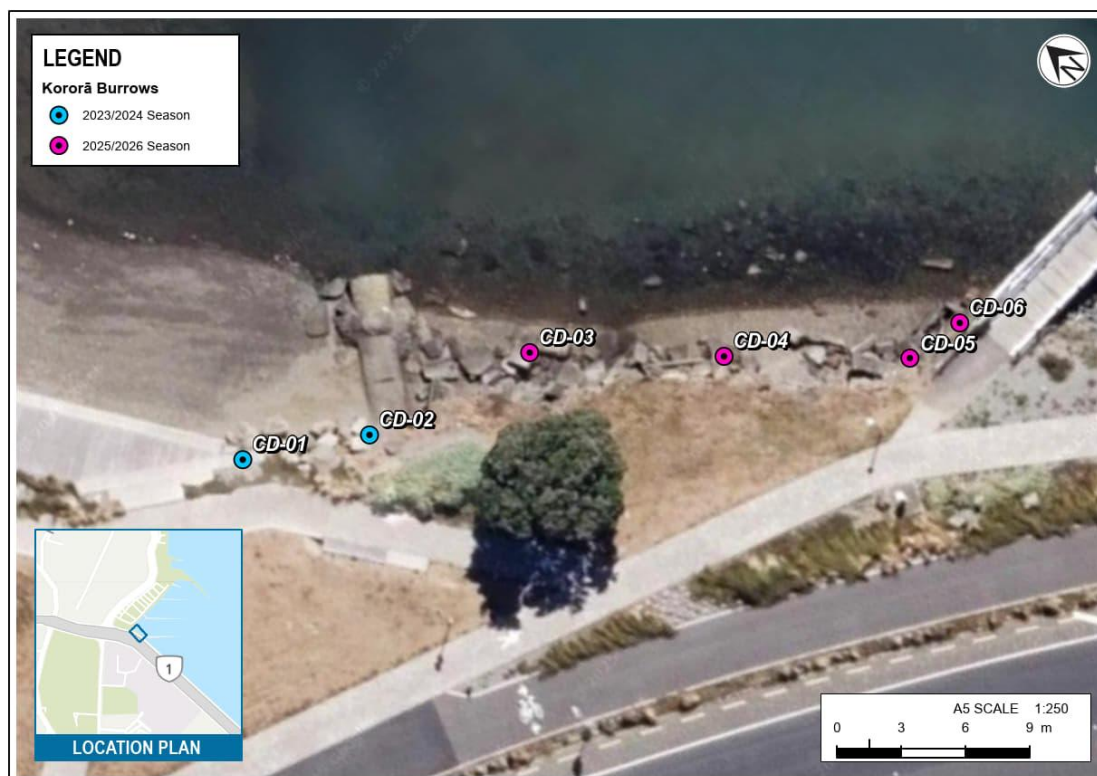


Figure 2.1: Detailed layout of kororā burrows found during 2023-2024 season surveys and November 2025 surveys in the vicinity of the stormwater outfall upgrade.

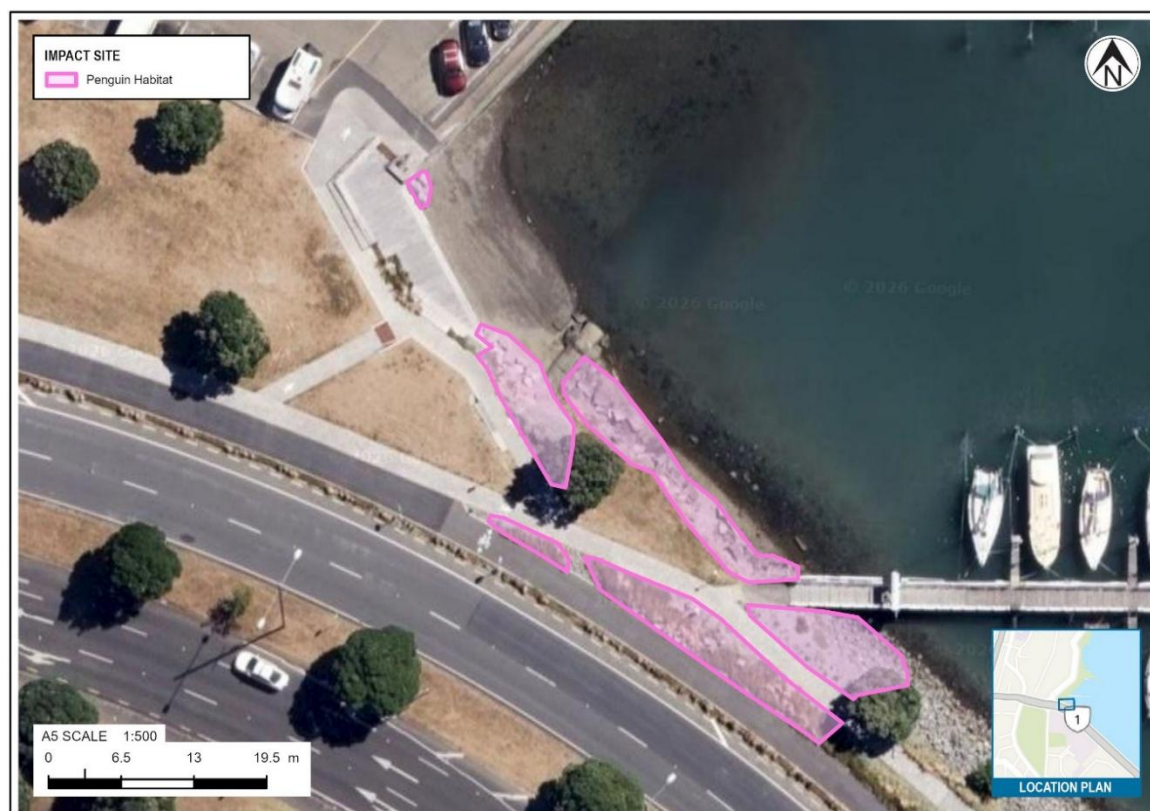


Figure 2.2: Potential penguin habitat identified within the ZOI.

2.3 Potential effects on kororā

Potential adverse effects on kororā within or nearby the project site are likely to occur primarily through:

- Permanent loss of potential refuge within current revetment structures.
- Potential disturbance to, injury and/or mortality of kororā during vegetation clearance and revetment deconstruction.
- Increased energy expense and decreased feeding productivity if foraging grounds are impacted through disturbance such as an increase in turbidity.
- In particular the disturbance or loss of eggs and chicks if clearance is undertaken during penguin egg laying or chick rearing timeframes (refer to section 2.1 for life cycle details), including the loss of reproductive productivity.
- Temporary loss of kororā burrows and habitat during modification of rock revetment.
- Temporary or permanent displacement can lead to increased risk of predation to kororā by mammalian predators and dogs, and increased risk of collisions with vehicles.
- Disturbance to kororā from dust, vibration, and noise during project works.

2.4 Effects management for kororā

Potential adverse ecological effects to kororā will be avoided, minimised, remedied, and compensated through various kororā management protocols described in the following sections. These include:

- Pre-construction kororā surveys.
- Programming destructive habitat clearance to commence between 1 March and 15 June.
- Contractor briefing on kororā management.
- Fencing installation and kororā exclusion measures.
- Works setback distances where kororā are identified.
- Noise management.
- Habitat clearance management.
- Maintaining kororā access to safe refuge.
- Relocation methodology and relocation site requirements.
- Compensation requirements for both permanent and temporary burrow and habitat loss.

3 Methods for managing effects to kororā

3.1 Overview

The following management options are proposed to avoid and minimise potential effects during all activities associated with the construction of the new outfall.

The methodologies have been adapted for local site conditions and habitat types. Due to the nature of the works proposed, the potential effects on kororā will extend beyond the project footprint. **As such, kororā will be managed both within the project footprint and all potential kororā habitat within 20 m of the project footprint** (henceforth referred to as the zone of influence; refer to Figure 3.1).

The methods described in this section are prescribed as a minimum requirement based on the associated risk of the activity being undertaken and the season in which it is occurring. Further

methods may be implemented at the discretion of the SQE. Section 3.5 outlines the timeline of management for kororā in relation to this project.

This KMP will be reviewed against the final resource-consent and Wildlife Approval conditions before implementation and any amendments certified where required.



Figure 3.1: Zone of influence – a 20 m buffer shown around areas of construction activity and enabling works activities. See Section 3.4.4 for the noise related basis for the ZOI

3.2 Constraints on the timing of works

3.2.1 Seasonal constraints

While kororā can be found onshore at any time of the year, kororā are more likely to be encountered during the breeding and moulting period (i.e. 16 June – 28/29 February). Disturbance to kororā during this time poses a greater risk of nesting failure or injury/mortality. Therefore, if kororā are confirmed as using the site for moulting or nesting, destructive construction activities such as habitat deconstruction and machine assisted vegetation clearance should commence between March 1 and June 15, unless a suitably qualified ecologist determines that management methods in section 3.4 can be appropriately applied so that potential adverse effects on nesting and moulting kororā can still be avoided.

The pre-works baseline survey (section 3.3.2) is a key component of any assessment made by the SQE. Timing destructive works during the non-breeding and non-moulting season provides more certainty and reduces risk to the remainder of the programme, as any kororā prospecting the site should not find any suitable habitat, and kororā will not have begun nest building, meaning there is a lower risk of kororā being found within the works footprint, and of any subsequently displaced kororā returning to the site during the remainder of the construction programme. Many

environmental factors affect the breeding and moulting periods for kororā, therefore the above timeframes may be adjusted by the SQE if there is evidence of out of season activity.

Under the management options outlined below, works may still occur during the breeding and moulting season whilst avoiding effects on kororā, though it is important the risks associated with works in each season are clearly defined to inform the best approach to programming works.

Works occurring during the breeding season (16 June – 15 February)

- Works occurring during the breeding season are potentially subject to delays if kororā are identified nesting within the ZOI. Egg laying in the Wellington Harbour typically occurs from late June through to September, with a peak in August (Bull, 2000; Pers. Comm., Places for Penguins). Exclusion zones of a minimum 10 m radius must be implemented to avoid and minimise effects on nesting kororā during this period (section 3.4.2). Egg laying to chick fledging takes approximately 14 weeks, meaning the required exclusion zones can have a significant impact on programme. If works are scheduled to start during this period, even if no nests are identified, there is a higher risk of kororā returning to the site as prospecting, site selection, and pair bonding may have already occurred.

Works occurring during the moulting season (1 December – 28/29 February)

- Works occurring during the moulting season are potentially subject to delays if kororā are identified moulting within the ZOI. Exclusion zones of a minimum 10 m radius must be implemented to avoid and minimise effects on kororā during this period (section 3.4.2). Moulting typically lasts 2-3 weeks, so the duration of the required exclusion zone may be less disruptive to programme than for an active nest. In contrast to nesting behaviour, there are significantly fewer preliminary indicators to predict when or if moulting will occur on site; consequently, the associated risk is less predictable.

To best monitor kororā activity and inform the appropriate management approach, if works are required in kororā habitat during the nesting and moulting season (i.e. 16 June – 28/29 February), kororā surveys with a DOC-certified protected species dog will be required on at least a fortnightly basis during the works, in accordance with the methodology set out in section 3.3.1 below.

Note: If works are to occur within the 16 June to 28/29 February window it must be noted that not all management options will be available, and that programme delays may occur.

3.2.2 Daily constraints

Kororā are less likely to come ashore during the day, typically leaving their burrows before dawn to forage at sea and returning only after dusk. Therefore, construction works will be scheduled during daylight hours, from 30 minutes after sunrise to 30 minutes before sunset.

Even with appropriate avoidance measures the likelihood of kororā presence during works is high. Therefore, irrespective of time of year or time of day, the processes outlined for the management of potential effects (section 3.4) will be followed.

3.3 Pre-works requirements

3.3.1 Kororā survey methodologies

Kororā surveys will be administered throughout the works schedule to inform the avoidance and management of effects on kororā relative to the proposed works. Surveys are required regardless of the time of year. Kororā survey requirements for activities prior to construction (enabling works) are outlined in this section. Kororā survey requirements during the construction programme are outlined in section 3.4.

All surveys will cover all potential kororā habitat (Figure 2.2) within the zone of influence (Figure 3.1) unless stated. Kororā surveys will be undertaken by a protected species dog team and SQE. Where a positive detection is made by the protected species dog, the SQE will investigate further using a burrow scope (or similar) to assist in identifying any burrows and their contents. The location where the detection was made will be marked on-site with an assigned burrow ID using a method agreed on by a SQE and the Construction Manager. In areas that are accessible to the public, care will be taken to not draw unnecessary attention to the burrow.

Where observations of kororā are made outside of their burrow (foraging or roosting in the open) a summary of activity observed will be recorded and GPS coordinates logged. The purpose of these observations is to further assess the use of the habitat to inform adaptive management (section 6). Where kororā do not move on of their own accord, management will apply as per section 3.4.

3.3.1.1 Data collection

The following information will be recorded for each kororā detection:

- Assigned burrow ID.
- Date and time of detection.
- Location of kororā detection/s with GPS coordinates.
- A photo of the nest location, clearly showing the entrance.
- Presence of any sign (e.g. Guano/feathers).
- Presence and number of any birds (moulting or non-moulting).
- Presence and number of any eggs or chicks.
- Whether the kororā is marked (banded, PIT tagged or any temporary markings).
- Signs of disturbance to the burrow.
- Any additional comments.

3.3.2 Pre-works baseline kororā survey

At least four weeks prior to the commencement of the construction sequence a kororā survey (as per section 3.3.1) will be undertaken by a protected species dog team and SQE. This survey will:

- Take place between September and December⁶.
- Cover all habitat within the zone of influence and the relocation site.
- Take place at low tide.

This survey will clarify the use of habitat by kororā to assist with the planning of works over the construction period. The number of active burrows discovered during this survey that may be impacted (directly or indirectly) by the works will inform the required capacity for the relocation site.

Additionally, the pre-works baseline survey will map out all identified and potential routes used by kororā to access habitat within and on the other side of the road corridor.

3.3.3 Pre-construction survey

Before the start of each construction sequence a kororā survey (as per section 3.3.1) will be undertaken by a protected species dog team and SQE. This survey will:

- Take place immediately prior to the commencement of works (i.e. the morning of).

⁶ This timeframe is prescribed as it coincides with the predicted peak of kororā activity at the site, thus avoiding false-negative results

- Cover all habitat within the zone of influence for the works area.

This survey will be used to confirm the presence/absence of kororā within the zone of influence, and inform the following management processes:

- If no kororā are detected works can proceed in line with any relevant effects management (section 3.4).
- If a breeding or moulting kororā is detected, a 10 m exclusion zone (as per section 3.4.2) will be implemented and works will not occur within 10 m of the burrow until it is determined that the burrow is no longer active by the SQE. Works can commence at a distance greater than 10 m of the burrow with noise management as per section 3.4.4.
- If non-breeding or non-moulting kororā are detected, works will not commence within 10 m until one of the following options has been implemented:
- Managing the kororā in situ (in line with section 3.4) where this is deemed by an SQE to be more beneficial to the kororā; or
- Relocating the kororā as per section 3.4.8.

3.3.4 Contractor briefing

Ahead of construction works, an SQE will meet with the contractor representative(s), mana whenua, and equipment operators on site to:

- Brief on fencing installation and fence/equipment and project footprint checks during construction.
- Brief on kororā and their nesting/burrow habits and signs that they are present.
- Confirm the location of any known burrows (informed by pre-construction survey).
- Confirm the procedure to be followed if a kororā or signs of a burrow are found.
- Confirm planned actions (in line with the KMP) to avoid kororā accessing the work site (e.g. Fencing maintenance, material left on site).

3.3.5 Fencing installation

Where access currently exists for kororā, exclusion of kororā from any machinery laydown areas or construction yards shall be achieved with the use of kororā proof fencing. Additionally, where kororā are displaced through the removal of habitat a fence will be installed to prevent access to the road corridor, or other unsafe environments as determined by the SQE. Fencing will be installed to block any access points to the road corridor within 30 m of destroyed or modified habitat. This should consist of mesh netting or a similar material (a combination of plastic mesh reinforced by metal mesh is recommended to prevent damage from rats or breakdown in coastal environments), securely attached from the ground up to at least 500 mm in height. Fencing must be weighed down with rocks or sandbags to prevent kororā from forcing entry underneath. This fencing will also be designed to exclude lizards (silt fencing) where it is used in conjunction with lizard management. Fencing delineation will be confirmed with the SQE.

All fences must be checked daily by a contractor (trained by the SQE) to ensure no gaps have opened overnight or throughout the duration of project works as detailed in section 3.4.1. Additionally, once per week the SQE will inspect all exclusion fencing.

3.4 Management of potential effects

3.4.1 Daily pre-start kororā checks

A daily check of the works extent will be conducted by a nominated person(s) trained by the SQE during the contractor briefing (as per section 3.3.4). The daily check will include surveying **the zone of influence** (i.e. 20 m outside of the works footprint) and will focus on identifying any signs of kororā presence (such as guano, feathers or roosting kororā) not previously identified. If any new signs are observed, works must halt within 10 m of the observed signs until inspection by SQE. If no signs are observed, works can start on that day.

The daily checks must ensure that all kororā-proof fencing is intact, with no gaps and that it meets the minimum height requirements. No materials or machinery will be left outside the fenced area overnight. If this occurs the SQE must be notified to confirm no kororā are present underneath.

3.4.2 Active burrow exclusion zones

In the event that an active burrow⁷ is discovered within the **zone of influence**, an exclusion zone will be established. The exclusion set back distances will be:

- Minimum 10 m setback from any vegetation clearance, demolition works, earthworks, rock placement and removal, and other activities as determined by the SQE.
- An additional setback to stay below noise threshold limits of 75dB $L_{Aeq(15min)}$ and 90dB L_{AFmax} as measured at the entrance of the burrow (as per section 3.4.4).

Visual and/or physical barriers will be implemented by the SQE and Construction Site Manager to demarcate the exclusion zone. At no time will the demarcation of exclusion zones impede access for kororā between the burrow and the ocean. The SQE is responsible for notifying the Construction Site Manager of all burrows within the zone of influence.

Exclusion zones will remain in place until either the kororā have been relocated if eligible (as per section 3.4.8), or the burrow is no longer active (i.e. moulting has concluded / chicks have fledged). In the case of the latter, exclusion zones will need to be in place for several weeks or months. In this instance the exclusion zones will be inspected weekly by an SQE and daily by nominated contractors. The inspections will consist of ensuring the exclusion zone still measures 10 m radius in all directions and inspections for damage to the materials used to demarcate the exclusion zone. If any are found to be insufficient in radius or damaged, they will be reinstated within 24 hours of the inspection.

In the event that works accidentally occur within an exclusion zone, all works on site will immediately cease and the SQE will be notified.

3.4.2.1 Kororā monitoring

If an active burrow is found within the zone of influence, the SQE will implement fortnightly monitoring until it is confirmed that the burrow is no longer active. Monitoring will consist of a visual inspection of the burrow and its contents by an SQE, and data will be collected as prescribed in section 3.3.1.1.

If through the fortnightly monitoring it is determined that the level of disturbance is greater than predicted and unacceptable the SQE will advise on further methods to reduce the level of disturbance.

⁷ Defined as a burrow containing, or likely to contain: a roosting or moulting penguin; nesting adults; viable nest contents (i.e. egg(s) or chick(s))

3.4.3 Vegetation clearance management

A kororā survey (as per section 3.3.1) will be undertaken by a protected species dog team and SQE prior to the removal of vegetation. This survey will:

- Take place immediately prior to vegetation clearance (i.e. the morning of).
- Cover all vegetation scheduled for clearance and habitat within 10 m of the vegetation.
- Align with Lizard salvage requirements where applicable.
- Be repeated prior to the commencement of vegetation clearance on every day that vegetation clearance is due to occur.

This check will be used to confirm the presence/absence of kororā within the vegetated area and within 10 m of the vegetated area, and inform the following management processes:

- If no signs of kororā are detected works can proceed.
- If any sign of kororā is discovered (feathers, guano), works will not commence until it is confirmed that kororā are not present. This may be achieved through manual clearance of vegetation at the discretion of the SQE.
- If a breeding or moulting kororā is detected no vegetation clearance can commence within 10 m of the active burrow.
- If non-breeding or non-moulting kororā are detected the following options will be considered:
 - Avoiding or delaying the destruction of the refuge by reducing the area required for vegetation clearance; or
 - Relocating the kororā as per section 3.4.8.

3.4.4 Noise management

To conservatively manage any noise disturbance from construction works on kororā, a noise management protocol will be implemented at the discretion of the SQE to ensure noise generated from construction activities does not measure above 90dB L_{AFmax} and 75dB $L_{Aeq(15min)}$ at the entrance of an active burrow⁸. Alternatively, in lieu of a kororā survey to determine burrow location, noise management will occur at the nearest point of potential kororā habitat.

Where a compliant setback is not achievable, the addition of noise barriers has been shown to reduce noise at the receiver by up to 10 decibels when placed both locally at the noise source and within the line of sight of the receiver (in this case, the burrow). Noise barriers should have a minimum surface mass of 6.5 kg/m². Suitable panels include 12 mm plywood or any of the following noise curtains or equivalent (as confirmed by the SQE):

- Hushtec 'Premium Series Noise Barrier' (www.duraflex.co.nz).
- Soundbuffer 'Performance Acoustic Curtain' (www.soundbuffer.co.nz).
- Safesmart 'Acoustic Curtain 6.5 kg/m²' (www.safesmartaccess.co.nz).

If noise levels are measured or predicted to exceed 90dB L_{AFmax} or 75dB $L_{Aeq(15min)}$ works cannot proceed. Further options will be investigated and implemented at the discretion of the SQE until noise levels can remain below a compliant level.

⁸ This is based on the human construction noise limits in NZS 6803:1999 as kororā have a similar hearing range. This is expected to be more protective than the 80 dB $L_{Aeq(1s)}$ limit used elsewhere (Marshall Day Acoustics, 2021). L_{Amax} is a fast-weighted maximum noise level, $L_{Aeq(15min)}$ is the noise level energy-averaged over a 15-minute period.

3.4.5 Removal of existing revetment

A kororā survey (as per section 3.3.1) will be undertaken by a protected species dog team and SQE prior to the removal of any revetment. This survey will:

- Take place immediately prior to the removal works (i.e. the morning of).
- Cover all areas scheduled for removal and a 20 m buffer.
- Be repeated prior to the commencement of rock removal on every day that rock removal is due to occur.

This survey will be used to confirm the presence/absence of kororā within the structure, and inform the following management processes:

- If no kororā are detected, removal works can occur under the supervision of the SQE.
- If a breeding or moulting kororā is detected works cannot commence within 10 m of the active burrow.
- If non-breeding or non-moulting kororā are detected works cannot commence within 10 m of the burrow until the kororā has been relocated as per section 3.4.8.
- Where the kororā cannot be extracted safely, a 10 m exclusion zone will be implemented until it is confirmed that the kororā has vacated the burrow.

3.4.5.1 Kororā exclusion and habitat modification

Kororā burrows adjacent to the rock removal area are still likely to be impacted by works, and therefore have the potential to delay works. Additionally, the remaining revetment is unstable and partial removal may cause risk to any kororā that continue to inhabit this area. To reduce risk to kororā and the risk of programme delays, it is recommended that any potential habitat within 10 m of the construction footprint is modified to prevent kororā access. The SQE will advise on measures to prevent kororā ingress ahead of construction. The measures listed below are deemed most suitable for the site conditions. Measures to investigate include:

- Establishment of kororā exclusion mesh over the top of the existing revetment, weighted down at all edges. This method may necessitate additional compensation to account for the time the burrow remains unavailable, if modifications are in place for longer than 12 months.
- Disestablishment of the revetment during the construction period, with rebuilding occurring during remediation works (section 4). This method may necessitate additional compensation to account for the time the burrow remains unavailable, if modifications are in place for longer than 12 months.
- Infilling of revetment. This method will require further compensation measures as the burrow will not be returned to original condition

A survey (as per section 3.4.5) will take place prior to any of the above methods being implemented. No exclusion or habitat modification measures will commence until the SQE has confirmed that no kororā are present.

3.4.5.2 Revetment rebuild / reinstatement of the modified area

The reinstatement of the revetment at the impact site will create new refuge for kororā, therefore introducing additional risk through the delivery of works if they are to occur over multiple days. By default, rock placement will be treated as a destructive activity and management will occur in line with section 3.4.5, however other mitigations may be used that minimise or eliminate this risk – such as utilising the high tide or spacing the rocks in a manner that does not create habitat. Consultation

with the SQE will occur prior to the reinstatement works to manage the timeline and subsequent potential effects on kororā, and mitigate any risks to the programme that may occur.

3.4.6 Kororā access during mitigation of sediment discharge

Silt fencing or silt curtains may be used as a tool for mitigating sediment discharge into the marine environment. Where this is implemented, kororā access must be maintained between known burrow locations (if they remain unmodified) and the ocean during times when kororā are most active. If silt curtains are installed in a way that will not trap kororā on the landward side then no further management is required.

Where silt fencing is implemented, the SQE will advise on where gaps in the silt fencing must be provided. Gaps in the fencing must be provided at least one hour before sunset, and cannot be closed until at least one hour after sunrise.

Where silt curtains are implemented, the curtain must be retrieved at least one hour before nautical dusk, and cannot be redeployed until at least one hour after nautical dawn. Silt curtains must maintain an exit path to the ocean to prevent kororā entrapment.

In the event a kororā is found stuck on the landward side of the fence or curtain, the SQE will be notified immediately. The kororā will not be handled or approached and all works within 10 m will cease.

3.4.7 Incidental discovery of kororā

In the event that a kororā not detected during pre-construction surveys or daily pre-works checks is discovered during works, works will immediately halt and a 10 m exclusion zone will be implemented. Passage to the ocean will not be restricted, and the kororā will not be handled or disturbed in any manner. The SQE will be immediately notified. If the kororā is not nesting⁹ or moulting, it may be relocated at the discretion of the SQE in accordance with the relocation protocol below.

3.4.8 Kororā relocation protocol

3.4.8.1 Kororā relocation site

The proposed relocation site is situated 250 m north of the project site at the Evans Bay breakwater, opposite the coastguard building (Figure 3.2). The breakwater is considered the closest available site that can provide adequate protection to kororā. The land is owned by WCC. Access to the breakwater is maintained for recreational use. The northern face of the breakwater is utilised as a storage area for WCC. The southern face has been planted in conjunction with Places for Penguins (PfP) to provide a kororā haven. Ten nest boxes are also maintained and monitored within this area¹⁰. The Project will seek to use these existing nest boxes, in collaboration with WCC and PfP. Should this not be possible, additional nest boxes may need to be placed within this area.

Kororā are known to occupy the breakwater year round, but monitoring by PfP indicates that it is not nearing carrying capacity. Over the 2025/2026 season only one nest box was occupied. The habitat consists primarily of low lying native shrub (Harakeke, Ngaio, Karo) with patchy rank grass in the understory. Additionally, the site has extensive and ongoing predator control and has dog control measures (dogs prohibited, and secure fencing around the perimeter). Additional signage will be implemented at pedestrian access points to the release site advising that dogs are restricted in this area.

⁹ The time from egg laying and incubation until chicks have successfully fledged the burrow

¹⁰ Any nest box that has evidence of use within 24 months prior to relocation will not be utilised by the Project.

Based on previous survey results (section 2.2, Figure 2.1) of the impact site, and using the most conservative estimate based on the possibility of all identified burrows being occupied by two adult kororā (which is unlikely given the characteristics of some of the burrows), up to 12 individuals could be found within the zone of influence (Figure 3.1). Of these, it is expected that only up to eight (i.e. kororā found in burrows CD-01, CD-02, CD-03, CD-4) would meet the impact threshold to justify salvage and relocation as they are within the works footprint. Up to four (i.e. kororā found in burrows CD-05, CD-06) would see greater benefit from in-situ management,¹¹ as they are sufficiently far away from the construction activities that exclusion measures and noise mitigation could be implemented successfully to minimise effects and avoid programme delays.

If survey results completed throughout the construction programme indicate that more than eight kororā may need to be relocated, DOC will be notified and adaptive management techniques and additional alternative locations or nest boxes may be implemented (as per section 6).



Figure 3.2: Proposed release site at Evans Bay breakwater

3.4.8.2 Capture, handling, and transport

Under no circumstances are breeding or moulting kororā to be handled under the relocation protocol.

The following steps will only be undertaken by, or under the direct supervision of, a named person on the WA.

¹¹ In-situ management consists of non-invasive measures that adequately minimise the impact to kororā, avoiding the need for relocation. Exclusion zones and noise management are the primary in-situ tools that would be applied.

Relocation of kororā will only be undertaken if the SQE determines that the stress of relocation is less than that of the kororā being managed *in-situ*. Where the kororā cannot be safely extracted, or the SQE makes the determination that the kororā should not be relocated, kororā will be managed in line with the remainder of section 3.4.

Capture, handling, and transport of kororā will be undertaken in accordance with the following methodologies and guided by NZNBBS best practice:

- All field equipment that kororā may come into contact with (e.g. carrier boxes, weigh bags, scales, etc.) will be sterilised.
- Hand sterilisation will be undertaken.
- Before any capture attempt, the SQE will prepare a carrier box lined with a towel for transportation of the kororā.
- Methods for capture for different habitat are as follows:
- To capture a kororā that is not occupying a burrow, the SQE will approach it from an angle that eliminates an escape path to the ocean. If this angle results in an unsafe escape path (i.e. towards road/project footprint) then additional persons will act under the guidance of the SQE to eliminate this risk. When accessible, the kororā will be caught from behind by grasping it around its body and pinning its flippers against its sides. The bird will be held firmly but care will be taken to not exert excess force.
- To capture a kororā occupying a burrow the SQE will slide their hand along the bottom of the burrow until the bird is located. The SQE will identify the feet and use a secure single hand double-hock hold to extract the kororā feet first from the burrow. If the kororā uses its flippers to provide resistance, the kororā may be gently eased side to side until the flippers release. No force will be applied to extract the kororā from a burrow.
- Following capture, the kororā will be held with two hands securing the flippers against the body and it will be immediately placed head-first into the carrier box.
- Only one kororā will be transported per carrier. Immediate relocation and release will be prioritised, however there may be situations where it is determined that delaying this is practical.¹² In this instance the SQE has discretion on whether release can be delayed. In the event that the release of kororā is delayed the maximum amount of time a penguin will be kept in a carrier box is two hours (inclusive of transport time). The carrier will be securely closed and kept in the shade. During transport the carrier box will be securely closed, and the box will be handled carefully ensuring that it always remains upright. The most suitable of the above capture techniques will be used for removal of kororā from the carrier.
- Prior to relocation any unmarked individuals will be temporarily marked using a vivid under the right flipper, or using another temporary mark as deemed suitable by the SQE, to assess whether birds remain at the relocation site or attempt recolonization of the project works site.
- The kororā will be relocated into penguin boxes within the relocation site. A different box will be used for each bird, unless two birds are being relocated from the same burrow in which case they will be released into the same nest box.
- Entrances to used nest boxes will be blocked for 24 hours post relocation to habituate the kororā to the box.
- If a kororā is injured as part of the relocation process, as per Section 7 the local DOC office will be contacted at the earliest opportunity within 24 hours to receive advice on what actions to

¹² For example, multiple birds from the same burrow need to be extracted

undertake. The closest facility for injured kororā is Te Kōhanga at Wellington Zoo. Wellington Zoo is located at 200 Daniell Street, Newtown. The contact number is 04 381 6755.

Any kororā that recolonise the site post-relocation attempt will be relocated to the same nest box.

The following information will be recorded for each kororā that is relocated:

- Date and time of capture.
- Name of handler.
- GPS location and burrow ID.
- Previous markings (PIT tag, band, temporary mark).
- Relocation site and nest ID.
- Time of release.

Any nest boxes utilised for relocating kororā will be checked 24 hours post-relocation to unblock the nest box entrance. The following morning the SQE will conduct another check to record whether kororā have vacated the nest box. Nest box contents will be recorded by the SQE and noted against the information recorded above.

DOC will be notified within 24 hours of each relocation event. Additionally, this information collected above will be reported to DOC at the conclusion of the Project, or as required by the WA.

3.4.8.3 Post-relocation monitoring

The success of kororā relocation is widely unknown in New Zealand. However, it is acknowledged that the site fidelity shown by kororā means they may not reside long-term in relocation sites. To inform future management measures it is important to capture this data where possible. Therefore, trail camera monitoring will be implemented for seven days from when the access to kororā nest boxes is reinstated. The SQE will record when each relocated kororā exits the nest box, and any further observations during the monitoring period. If any kororā are relocated, annual monitoring will occur at the relocation site in line with compensation site monitoring (as per section 5.1). Where there are community groups undertaking monitoring already, this requirement should be aligned with their programmes to reduce duplication and overall disturbance of kororā.

3.5 KMP implementation programme

Table 3.1: Implementation schedule for kororā management

Deliverables	Timeframe	Personnel	Completed
Prior to project start			
Baseline kororā survey (section 3.3.2)	Minimum 4 weeks prior to works commencing, to be undertaken between September and December	SQE and protected species dog team	
Pre-construction kororā survey (section 3.3.3)	Immediately prior to enabling works commencing (i.e. site investigations, site set up)	SQE and protected species dog	
Contractor briefing (section 3.3.4)	Prior to site set up	SQE and Mana Whenua	
Fencing installation (section 3.3.5)	Prior to commencement of works	Site personnel under guidance of SQE	

Deliverables	Timeframe	Personnel	Completed
Vegetation clearance management			
Kororā survey and vegetation removal (section 3.4.3)	Coordinated with Lizard Management Plan requirements	SQE and protected species dog team	
During ongoing works			
Daily pre-start kororā check (section 3.4.1)	Daily, prior to the commencement of works	Site personnel, SQE	
Noise management (section 3.4.4)	Daily, where burrows are identified	SQE and/or site personnel	
Removal of existing revetment (section 3.4.5)	Daily, when works are occurring	SQE and protected species dog	
Kororā relocation (section 3.4.8)	March 1 – June 15 (or outside this period at the discretion of the SQE if the birds are non-nesting or non-moulting)	Named WA persons, protected species dog team	
Post relocation kororā monitoring			
Post relocation kororā monitoring (section 3.4.8.3)	Seven days following relocation efforts	SQE	
Reporting			
WA compliance reporting (section 8)	Completed within 30 working days following completion of the Project	SQE	

4 Remediation measures

Following construction, remediation measures will be applied to the zone of influence to improve the site condition for kororā. Due to the limited space available, the remediation measures recommended here primarily serve to maximise the benefit of the compensation actions. Overall, these remediation measures combined with the recommended compensation measures provide an improvement in the quality of habitat and refuge available for kororā, and provide more protection from the effects of sea-level rise. The remediation measure recommended for this project includes reinstating the revetment protecting the outfall in collaboration with a SQE so that it provides resilient kororā access to the compensation site (section 5).

5 Compensation measures

The impact site has limitations in its ability to provide offset, namely that the lost burrows could not be reinstated like-for-like within the new revetment as it is currently designed, and any design changes to facilitate this are unlikely to be successful in the medium to long term as sea-level rise would likely impact the functionality of the new burrows.

Therefore, compensation at the impact site (as opposed to offset) is deemed to be most beneficial for kororā. Burrow loss (permanent and temporary) will be compensated through the installation of nest boxes above the impact site, set back from the revetment edge. The location and the design of the nesting structures have been chosen after considering environmental factors relative to the site, and the information available on the success of different nesting structures (nest boxes vs concrete culverts). Nesting structures incorporated into the crest of the revetment would be approximately 2.2 m above RL MSL, whereas nesting structures integrated into vegetation set back

from the crest would be approximately 2.7 m above RL MSL (see Part G of the Application - drawing set - DNG-DRG-01105_01107 - Stormwater details). Therefore, structures integrated into vegetation set back from the crest are recommended due to greater sea level rise resilience. Furthermore, in this instance, nest boxes are recommended over concrete culverts as they have a longer track record and are known to be successful in similar urban coastline environments (Bourne and Klomp, 2004). Nest boxes are also shown to be preferable to many natural burrows, so this application is considered to be like-for-unlike “trading up”. The temporary loss of habitat will be compensated through coastal planting to provide shade¹³ and habitat, and fencing to prevent access to the road.

The Biodiversity Compensation Model (BCM, Baber et al. 2021) was applied to the biodiversity values impacted by construction. Values were assigned and assessment factors in the BCM such as time lags and risk contingency were accounted for and reported in the Marine Ecology Technical Assessment (#12) provided in Part E of the application package. Overall, to achieve no net loss, the BCM calculations support the recommendation that the following should be installed in the area above the impact site:

- A minimum of six nest boxes to be installed above the impact site.
- A minimum of 60 m² of coastal planting around the nest boxes.
- Fencing to protect the 60 m² of habitat against access to the road corridor.

Nest boxes (built to an accepted DOC or New Zealand Penguin Initiative (NZPI) design) will be placed under shade, away from line of sight to the public, and dug approximately 50 mm into the substrate. Nest boxes will be placed in pairs with minimum 2 m spacings between the entrances, with a minimum of 10 m between clusters. Entrances to the burrow will be pointed generally towards the ocean, but angled so that during southerly and north-westerly winds there is still adequate shelter provided to inhabitants. Nest box lids will be screwed in place, and nest boxes will be secured to the ground with two fiberglass Y-posts. Nest boxes will be built from treated timber and allowed to age in direct sunlight with the lids ajar at 90 degrees for **three months** prior to installation. The compensation site should be monitored and maintained annually for **5 years**.

Predator control was not selected as a compensation action due to the ongoing efforts of Predator Free Wellington in this location. The impact site has been deemed free of rats and mustelids since January 2024, and the surrounding area of Hataitai is currently deemed predator free (Predator Free Wellington, 2025). Should Predator Free Wellington operations cease or decrease prior to delivery, or within the 5 year monitoring period, predator control will be reconsidered.

In addition, it is recommended that kororā and dog control educational signage is installed at the compensation site, subject to the agreement of WCC (as landowner).

5.1 Compensation site maintenance and monitoring

Monitoring and maintenance will be implemented over at least a five-year period to track kororā site use and ensure protective measures remain effective and the compensation approach has been implemented as intended. Longer term monitoring and maintenance will be sought in partnership with mana whenua and community groups. Surveys of nest boxes will take place once per year during the breeding season and once per year at the conclusion of the moulting season. Monitoring data will be collected in line with section 3.3.1.1, and will be used to record seasonal occupancy and infer life cycle stages being supported by the site.

Maintenance will focus on keeping all management assets functional and reducing risk to kororā. Nest boxes/artificial burrows will be inspected annually post-moulting and repaired/replaced as

¹³ The planting will provide both daytime shade cover for the nest boxes and shading from the streetlights along Cobham Drive at night.

required. Nest box entrances will be cleared of weeds and infill planting will be completed as required. Fencing will be inspected during monitoring and maintenance checks, with priority repairs completed as soon as practicable where breaches could allow predator or dog access. Results will be recorded in a central log and reviewed annually to support adaptive management, with triggers for increased effort including confirmed predation or repeated disturbance incidents.

Remedy of any compensation implementation issues within the Project's control (i.e. planting fails to establish, fencing deteriorates, nest boxes are damaged) will be addressed by the Project. However, the recolonization of kororā is outside of the Project's control due to the numerous environmental factors that could influence this. Reports from annual monitoring should discuss relevant environmental factors that may be influencing the recolonization of the compensation site, in order to inform future projects and compensation modelling.

6 Adaptive management measures

To achieve the best outcomes for kororā, changes may need to be made to this KMP. The rationale behind any changes must be based on robust management techniques and will be discussed with DOC, Greater Wellington Regional Council, and the client and must be agreed in writing. This adaptive management process is to be used for any changes that don't result in a material difference in outcome when compared to this KMP and as such these changes will not require a variation to any granted WA.

7 Accidental injury and/or mortality of kororā

The following steps will be implemented if any injured or dead kororā are found during construction and survey work:

- Works will cease until sufficient information has been gathered to inform the cause of death or injury and it is deemed safe to resume works.
- The SQE will notify DOC and mana whenua at the earliest opportunity within 24 hours after an injured or dead kororā is found.
- Any deceased kororā shall be sent to Massey University Wildlife Post-mortem Service for necropsy if required by DOC. The body is to be chilled if it can be delivered within 24 hours, or to be frozen if longer than 24 hours to deliver.
- Injured kororā found will be taken by the SQE to a suitably qualified veterinarian as soon as possible for assessment and treatment. The closest facility to the Project is Te Kōhanga The Nest at Wellington Zoo. Injured kororā will be kept in an appropriate pet transport carrier under the direction of the SQE to ensure the animal is handled appropriately until the kororā can be assessed and treated.
- Kororā assessed by the veterinarian or alternative specialist as uninjured, or otherwise in suitable condition for release, will be transported to the kororā relocation site and released into habitat suitable for the species being relocated.
- Euthanasia of an injured kororā shall only be undertaken under direction from DOC and/or by an authorised vet.
- All costs incurred through treatment or necropsy of injured and dead kororā respectively will be covered by the Wildlife Approval holder.

8 Reporting requirements

A compliance report will be prepared and submitted to Mana Whenua, Greater Wellington Regional Council, Wellington City Council, and the Department of Conservation within 30 working days from the completion of the Project. The report will be made available to any other relevant stakeholders,

and data uploaded to the New Zealand Penguin Initiative database. Furthermore, DOC will be notified within 24 hours of any relocation event.

The report shall include the following:

- Confirmation that kororā surveys and necessary relocation operations were undertaken in accordance with the KMP, WA and any associated consent conditions.
- Survey, relocation, and relocation monitoring results.
- Representative photographs of the survey methodologies, kororā relocated, survey site and relocation site.
- Any other additional reporting requirements stipulated in the relevant WA.

Additionally, annual monitoring reports at the compensation site and relocation site shall be made available to the Department of Conservation, Mana Whenua, Wellington City Council, and Greater Wellington Regional Council.

9 Applicability

This report has been prepared for the exclusive use of our client New Zealand Transport Agency, with respect to the particular brief given to us and it may not be relied upon in other contexts or for any other purpose, or by any person other than our client, without our prior written agreement.

We understand and agree that our client will submit this report as part of an application for resource consent under the FTAA and that The Panel as the consenting authority will use this report for the purpose of assessing that application.

Tonkin & Taylor Ltd

Report prepared by:

Authorised for Tonkin & Taylor Ltd by:

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Technically Reviewed by Marcus Cameron: Technical Director - Marine ecology and water science

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Appendix A WCC Detector Dog Survey

Wellington City Council Forest and Bird- Places for Penguins Penguin Detection Report

Presented to: Kerry Shaw and Daniela Biaggio

Presented by: Alastair Judkins

AJ Wildlife Detection Dogs

September 16 – 21, 2021

Contact:



Date:

October 8, 2021

Introduction

The coastline of Wellington, from Balaena bay to Te Kopahau carpark, was surveyed for the presence and distribution of little penguins by Alastair Judkins using a specialized little penguin detection dog, named Mena. Both Alastair and Mena are fully certified by the Department of Conservation, Conservation Dog Programmed as a Protected Species Detection Dog Team.

Methods

Surveys were conducted from 16 – 21 September, 2021, for a total of 6 days of surveying, with an additional day spent collating and organizing data for this report.

The team worked in the areas of Balaena bay to Shelly Bay on the 16th, Shelly Bay to Karaka Bay on the 17th, Karaka bay to Wahine Memorial Park on the 18th, Wahine Memorial Park to Lyall Bay on the 19th, Lyall Bay to Houghton Bay on the 20th and Houghton Bay to Te Kopahau carpark on the 21st of September. Where possible and practical the hillside of the survey areas was also searched

The area of buildings and shoreline of Shelly Bay were not surveyed due presence of protestors who opposed the survey for little penguins by the team. I communicated with Taranaki Whanui (PNBST) that any confrontation directed at either myself or the dog would signal the cessation of the survey. This was agreed upon with full understanding.

As requested, penguin sites were marked with spray painted "K" and flag tape where spray paint was not feasible.

Data were collected using a custom-made application designed using the programme CyberTracker and installed on a Samsung tablet with a waterproof

protective casing. At each penguin site, data were collected on the GPS location of the site, date, time, percent cloud cover, wind direction, wind strength, whether it was raining (Yes/No), detection type, site type, and if there were any adults, chicks and/or eggs confirmed present. A hand-held torch was used to locate burrows and to identify if penguins were in residence at the time. Extra notes were also recorded when needed.

Data were downloaded onto a laptop computer at the end of each day and the data extracted and converted into an Excel spreadsheet with all the data for each site detected (Appendix I).

Results

In total, 152 sites were detected by Alastair and the dog. An Excel spreadsheet with all the data for each survey area is included as Appendix I.

Sites were predominantly detected by the dog, and occasionally by Alastair. The dog indicated by either showing interest, sitting, pointing or a combination of indication types.

Sites identified ranged from penguin nests, coastal entry point trails, to sites where the dog gave strong indications, but the conditions of the terrain or vegetation limited detailed investigation.

Some sites had penguins visible, and some were identified as having eggs and chicks. Many sites were identified as burrows or probable established sites, but the end of the burrow was out of view, so it was not possible to confirm if a penguin was in residence at the time.

The type of habitat that penguin sites were detected was varied. These included riprap walls, breakwaters, shoreline caves and crevices, natural burrows in shoreline banks, natural burrows in coastal scrub/flax, nest boxes, concrete structures and under canoes

Areas with especially high concentrations of penguin sites included the riprap wall of Point Halswell, Karaka and Scorching Bays, and Lyall Bay boulders close to the beach.

Most boulder and riprap walls in the area were hot spots for penguin activity

Areas with no or very low concentrations of detected sites included the main Lyall Bay Beach, Island Bay. Details for each area are provided below.

Day 1:

In total, 31 sites were identified on September 16th.

There were adults sighted on 14 sites and at 3 sites eggs were sighted. There were 10 sites with adults seen that may have been sitting on eggs but were not disturbed to confirm.

Site #11, at the Evan's Bay sailing club, seemed to have been partially dug out by a dog.

It was unfortunate to see that a known breeding site on Cobham Drive had been sealed off by boulders, gravel and, ironically, a predator trap after years of monitoring and huge effort and expense to protect it, only for the nest to be blocked up in the final stages of the project. (see photo below).

