Boffa Miskell

Seaview Wharf Renewal

Kororā / Little Blue Penguin Management Plan
Prepared for CentrePort Ltd

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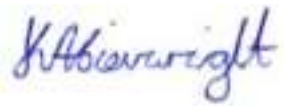
Prepared by:	Karin Sievwright Ecologist / Professional Boffa Miskell Limited	
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Appendices

1.0 Introduction

CentrePort Ltd are undertaking repair and renewal works (the 'Project') of the existing Seaview wharf to improve the seismic resilience and operational safety of the wharf. The redevelopment will involve construction / installation of a site compound, construction of a temporary construction wharf / staging platform, renewal of the main wharf, approach wharf, berthing and mooring structures at Seaview and replacement of the wharf abutment and associated rock revetment. The rock revetment at the Seaview wharf has been confirmed to provide habitat for little blue penguins (*Eudyptula minor;* kororā), an At Risk – Declining species.

The resource consent (WGN210305) for the Project requires the preparation of a Little Blue Penguin Management Plan as per the following consent conditions:

(15):	*Prior to undertaking works, the consent holder shall submit a Little Blue Penguin Management Plan (LBPMP) to the Manager[1] for certification 20 days prior to the commencement of works. The LBPMP must be prepared by a suitably qualified person and shall include, but not be limited to:* • *Recommended actions to take in order to avoid potential adverse effects on penguins (in accordance with Section 5.4.1 of appendix 7 of the application document;* shown in Appendix 1 of this document). • *Recommended actions to take if penguins are encountered during the construction period.* • *Details of how penguins will be monitored throughout the construction period.* *No works shall commence until the consent holder has received written notification that the LBPMP is certified by the Manager.*
(16):	*Within 24 hours prior to undertaking construction works (removal of riprap to facilitate staging platform and works on the approach wharf) and in conjunction with a suitably qualified coastal ecologist (SQCE) and a LBP detector dog, the consent holder shall undertake an inspection of the works area (specifically above the high tide line of the rock revetment) to establish whether there are any LBP present. If LBP are observed, the consent holder must undertake actions to avoid effects on LBP in accordance with Condition 15.*
(17):	*The consent holder shall carry out the works for the relevant stage in accordance with the certified LBPMP required by Condition 15.*

This LBPMP has been prepared to fulfil these consent condition requirements for the duration of enabling and construction works for the Seaview wharf repair and renewal works.

2.0 Glossary

The following terms are used in this document and are defined as follows:

[1] The manager is not defined in the consent condition, but it is interpreted as being the person at Greater Wellington Regional Council responsible for certifying this management plan.

- **Effects Zone:** the zone around an active kororā burrow (defined below) in which effects need to be managed when undertaking construction / installation of the site compound, temporary wharf / staging construction and operations, wharf abutment construction works, onshore and nearshore piling works, rock removal works and revetment works. For rock removal works this zone is 10 m. For other construction activities this zone is where 70 dB $L_{Aeq(15\ min)}$ is achieved within an active burrow.
- **Active Burrow:** a kororā burrow containing, or suspected to contain, a nesting bird, viable nest contents (egg(s) and / or chicks (s)), or moulting bird based on the time of the year and other evidence observed at the burrow location by a suitably qualified and experienced coastal ecologist.
- **Direct Impact:** an outcome resulting in changes to an ecological feature that is directly attributable to a defined action.
- **Indirect Impact:** in this context – an outcome resulting in changes to an ecological feature that is at some distance from the source.
- **DOC:** the Department of Conservation who is responsible for reviewing the permit application for the project to capture, handle and relocate penguins and authorising / issuing the permit for the project.
- **Suitably Qualified Coastal Ecologist:** a person who with a tertiary ecology qualification and experience working with kororā (or if a tertiary qualification is lacking, a person with kororā experience that is approved by DOC). They will be responsible for supervising and advising on kororā management actions for the project as required.
- **DOC-Permitted Kororā handler:** a person who is listed in the Wildlife Act permit for the project to capture, handle and relocate kororā.

3.0 Kororā / Little Blue Penguin

3.1 Breeding Biology

Kororā / little blue penguin (*Eudyptula minor*) (Photo 1) are protected under the Wildlife Act (1953). They are native to New Zealand and Australia and are the smallest of all the 17 penguin species. In New Zealand they are widely distributed along the coastlines of the main and offshore islands (Heather & Robertson, 2015; Marchant et al., 1990), with the national population estimated to be c. 50,000-100,000 (Robertson & Bell, 1984; Taylor, 2000). They breed in loose colonies, and in Wellington they breed around much of the Wellington Harbour coastline. The largest colony in Wellington is on Matiu / Somes Island, which has an estimated *c.* 300 pairs / 700+ adults (de Lisle 2014, Rumble 2018b, Taylor 2018 *in* Overmars (2019)).

Photo 1. Adult kororā / little blue penguin.

Kororā / little blue penguins are nocturnal, typically coming ashore after dusk and leaving before dawn. Adults are present at colonies throughout the year, though numbers are lowest between completion of moult (April) and start of breeding (July) (Marchant et al., 1990). Bullen (1997) reported very few birds on Matiu/Somes Island from March-June.

For most colonies in New Zealand the breeding season begins around August and continues until January when chicks fledge. The yearly cycle of kororā / little blue penguins on Matiu / Somes Island has three overlapping stages (Figure 1): (1) occupation of burrows and pair formation; (2) breeding (eggs and chicks); and (3) moulting. Egg laying (one or two eggs) generally occurs from late July through to mid-November, with a peak period from late August to late September (Bull, 2000b; Kinsky, 1959, 1960). Chicks generally fledge the burrow between December and February. Moulting occurs post-breeding between January and March). Kororā / little blue penguins are confined to land during the annual moult (mainly between January and March), during which all feathers are replaced simultaneously over the period of 2-3 weeks (Gales et al., 1988; Kinsky, 1960; Reilly & Cullen, 1983). Moulting birds fast for the entire moult period as they are unable to swim without getting water-logged (Heather & Robertson, 2005).

For the purposes of this project, **the current observed breeding and moulting period for kororā is 16 June to 28 / 29 February.** This differs to the period stated in the Ecological Impact Assessment for this project (1 July to 28 / 29 February). This is due to learnings and observations made in June and July 2021 at Matiu / Somes Island where kororā were observed breeding earlier than anticipated, marking a potential localised shift in the timing of breeding. We note that the current dates for the breeding and moult period are specific and kororā monitoring in the effects zone during this period will ultimately inform when construction works can commence. This is discussed further in Section 4.2.

Figure 1: Indicative[2] breeding cycle of kororā / little blue penguin in Wellington Harbour.

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Burrow occupation												
Pair bond / nest building												
Egg laying												
Chick rearing / fledging												
Moulting												

3.2 Kororā Nesting / Moulting Habitat

Kororā / little blue penguins form loose colonies, with burrows located several metres apart (Braidwood, 2009; Bull, 2000a; Bullen, 1997; Marker, 2016). Colonies can range in size from a few to hundreds of pairs. Burrows are generally situated close to the sea in burrows excavated by the birds or other species, or in caves, rock crevices (including rip-rap revetments), under logs or in or under a variety of man-made structures including nest boxes, pipes, stacks of wood or timber, and buildings. Along the coast, kororā burrows are located above mean high water spring (MHWS) to ensure that waves do not inundate the burrow and its contents.

Kororā / little blue penguins exhibit high levels of site fidelity, generally returning to the same landing site and nest each breeding season (Bull, 2000b; Pledger & Bullen, 1998). Several studies have shown the ability for little penguin to adapt their nesting behaviour to urban environments; in response to the lack of “natural” habitats, birds successfully nest in rock crevices and human-made structures, such as breakwaters, that offer protection from the weather, tidal action, predators and human disturbance (Bourne & Klomp, 2003; Giling et al., 2008).

Along the coastal margin of the project site, cervices in the loose rip-rap (refer to Photo 2) above mean high water springs (MHWS) provide nesting and moulting habitat for kororā. A number of kororā surveys have been conducted along the rock revetement within and adjacent to the project site and numerous burrow and penguin detections have been made (Appendix 2).

[2] Based on information in the following sources: Bullen (1997), Kinsky (1959, 1960).

Photo 2. Riprap rock revetment little blue penguin habitat within the project site.

4.0 Kororā Management

Construction activities and pieces of equipment associated with the project that may potentially have an adverse effect on kororā include the following:

- Piling works (vibro piling, impacting piling with dolly, auger drilling)
- Use of a large breaker to break rock armour (possibly will not be used)
- Operation of a 100 T crawler crane
- Hydro demolition
- Concrete / paver cutting
- Operation of a hand breaker to break rock armour
- Grinders / power tools
- Concrete pump
- Truck and excavator movements
- Concrete wire cutting
- Mobile crane
- Generator

- Light tower

Adverse effects may occur due to the potential physical disturbance of active nests / kororā or from sustained noise and vibration in close proximity to active nests / kororā. This section outlines methods to avoid and / or manage potential effects on kororā while undertaking these activities within the effects zone[3] (defined in Section 2.0). Different methods are proposed for the management of non-breeding / non-moulting kororā and breeding / moulting kororā (if encountered).

4.1 Avoiding Potential Effects on Kororā

To avoid potential effects from construction works on nesting or moulting kororā, if practicable, construction works within the potential[4] effects zone will be prioritised to occur during the non-breeding and non-moult periods (i.e. 1 March to 15 June) rather than during the breeding season and moult periods (i.e. 16 June to 28/29 February). This is particularly the case for the noisiest and potentially most disturbing activities such as piling, drilling and breaking concrete and rock armour.

4.2 Construction Works (During the Breeding and Moulting Period)

If it is not possible or practicable to avoid conducting construction works within the effects zone during the kororā breeding season and moult period (currently 16 June to 28/29 February), then pre-construction[5] kororā surveys will be conducted to manage potential effects on birds, as outlined in Section 4.2.1. The survey results, in combination with results from regular monitoring conducted throughout construction (refer to Section 6.0), will determine if and what management actions are required; such actions will be overseen by a suitably qualified coastal ecologist (as defined in Section 2.0) who will communicate with DOC and the DOC-permitted kororā handlers for the project as required. Note that these management actions are summarised in flow diagrams in Appendix 5.

Training will be provided to onsite contractors to identify signs of penguin habitation (e.g. moulted feathers and guano (penguin poo)) and to discuss actions required to secure work sites, construction materials and equipment to prevent kororā access. This training will be run by a suitably qualified and experienced coastal ecologist.

We note that the current dates for the breeding and moult period are specific, but that construction works in the breeding and moult period can commence as soon as any penguins in the effects zone have completed breeding or moulting activities (which may occur prior to 28/29 February).

4.2.1 Pre-Construction Survey

Within 24 hours prior to the commencement of works for the site compound, temporary construction wharf / staging platform and abutment works (i.e. the different stages of work) a

[3] The effects zone is the zone around an active kororā burrow (defined below) in which effects need to be managed during construction works. For rock removal works this zone is 10 m. For other construction works, including piling works, this zone is where 70 dB $L_{Aeq(15\ min)}$ is achieved within active burrows. Airborne noise management is explained further in Section 4.2.3.

[4] That is the area of revetment where construction works will occur in which active kororā burrows have previously been observed.

[5] Includes prior to the movement of rocks on the revetment.

pre-construction kororā survey will be conducted by a DOC-certified conservation dog and handler in conjunction with a suitably qualified coastal ecologist. Pre-construction surveys will also be conducted in the same timeframes and manner prior to the commencement of rock removal from the revetment, onshore piling works and nearshore piling works (within 50 m of the shoreline)[6] as per Condition 16. Preferably, these surveys will be conducted on the morning of the commencement of works to minimise the risk of birds re-establishing themselves in the area between the time of survey and the start of works.

These surveys will be conducted in penguin habitat (Appendix 3) that is above mean high water springs.

If a detection is made, a burrowscope or camera will be used to assist with identifying the burrow contents. As per the monitoring surveys described in Section 6.0, if a detection is made, the following information will be recorded:

- Location of dog detection/s
- 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

The location of each detection will be assigned a number which will serve as an individual identifier to enable burrows to be monitored over time. The rock at the entrance to each burrow will be marked with dazzle paint (or an effective alternative). The location/s will also be recorded with a GPS (and added to a habitat map), a photograph will be taken (of the burrow and its context in the wider project site), and a description of the location/s will be noted. These results will be reported to DOC and GWRC as per Section 9.0.

If non-breeding or non-moulting kororā are detected within the effects zone during the pre-construction surveys (or incidentally during works), then the capture, handling and relocation procedures outlined in Section 4.2.2 will be implemented.

If breeding or moulting kororā are detected within the effects zone during the pre-construction surveys for the commencement of works for the site compound, temporary construction wharf / staging platform, abutment works, and piling works (or incidentally during these works), then the airborne noise management procedures (and associated setback to achieve 70 dB $L_{Aeq(15\ min)}$) outlined in Section 4.2.3 will be implemented.

If breeding or moulting kororā are detected during the pre-construction surveys for rock removal work (or incidentally during works), then rock removal within 10 m of an active burrow will not proceed until nesting or moulting activities have been completed as outlined in Section 4.3.

If no kororā detections are made, construction works will commence.

We note that adaptive management is proposed in that management methods, particularly the noise management approach, will be confirmed based on other construction works occurring in kororā habitat that are also using this approach and trials that will occur at Seaview. The management approach will not be changed without having conversations with DOC and Greater Wellington Regional Council (GWRC) and if changes are proposed, this plan would be re-submitted to GWRC for approval.

[6] These are specific construction works that may have the biggest potential impact on active burrows.

4.2.2 Capture, Handling and Relocation

These procedures will only occur once a DOC Wildlife Act Authority (WAA) has been obtained. CentrePort is currently preparing an application for this Project and if obtained, only those personnel listed in Schedule 1 of the WAA will be authorised to manage (capture, handle and relocate) kororā[7]; anyone not listed in the permit Schedule will not be permitted to capture or handle kororā.

For the purpose of this report, the term "DOC-permitted person" is used to reference those personnel listed in Schedule 1 of the DOC WAA being obtained for this Project.

Breeding[8] or moulting birds will be not be handled or relocated.

4.2.2.1 Procedure

If non-breeding or non-moulting kororā are discovered within the effects zone (defined in Section 2.0) during a pre-construction survey, or incidentally during works (both within and outside of the kororā breeding and moult periods), works will not commence, or if underway, halt immediately, until the penguin/s has been moved to the relocation site (see Appendix 4) by an authorised person / handler[9]. Upon discovery of the kororā, the construction manager will be informed, and the process outlined in Appendix 4 will be implemented immediately to arrange the capture, handling and relocation of the bird.

While waiting for the arrival of an authorised person, the kororā will not be handled or disturbed further. If the kororā is injured, DOC will be immediately contacted to receive advice on what actions to undertake.

Before a kororā is caught, the DOC-permitted person will put on a pair of gloves[10] and get a ventilated and sturdy pet carrier box[11] that is lined with a towel in preparation for transporting the penguin.

To minimise stress to the penguin, the maximum amount of time a penguin will be kept in a carrier box is two hours (immediate relocation and release will be prioritised) and the box will be kept in the shade. The carrier box will be securely closed and the box will be handled carefully, ensuring that it remains upright at all times, especially if the penguin is transported by vehicle to the release site; if so the carrier box will be propped up so that it cannot topple.

For this Project, the recommended release site is the Days Bay Penguin Haven (Appendix 4). This site was suggested by DOC and Mike Rumble (local penguin expert) and will be included in the Wildlife Act Authority application. The protocol for accessing this site is outlined in Appendix 4.

Before releasing, the bird will be marked on the head using Twink. This temporary marking will allow the easy identification of any birds that return to the project site within a few days of being moved to the release site.

Records of all kororā movements will be kept including:

- location, date and time penguin found;
- if the bird is banded;

[7] Those listed will include people who fulfil the definition of a suitably qualified coastal ecologist (i.e. a person who with a tertiary ecology qualification and experience working with kororā) or a DOC wildlife ranger.

[8] Includes nesting adults and nest contents (i.e. eggs and / or chicks).

[9] Approved handlers will be listed in Schedule 1 of the DOC Wildlife Act Authority.

[10] Gloves must be worn as the oil on a person's hands can interfere with the waterproofing of penguin feathers).

[11] Approximate dimensions: 40 cm length, 30 cm width, 35 cm height.

- the number of penguins moved;
- the handler and where the penguins were relocated to;
- the time of release; and
- if any birds are recaptures (identified through the Twink markings).

This information will be entered into an excel spreadsheet, the results of which will be provided by CentrePort to DOC and GWRC on an annual basis during construction.

Following relocation, the area in which in the bird was relocated from will be modified until construction has been completed (in this area). The purpose of this is to prevent the kororā from potentially re-gaining access to this area. The form of modification may include removing as much rock as possible, so a bare ground surface is exposed thereby leaving no crevices for kororā to occupy, or fencing off the site with a penguin proof material / fence.

4.2.3 Noise Management

Sustained noise levels[12] above approximately 80 $L_{Aeq(1\ sec)}$ have the potential to illicit a behavioural response in penguins, particularly if birds are nesting or moulting (Hughes et al., 2008)[13]. This is because these are stressful periods of the penguin life cycle, in which birds are land-based (i.e. moulting birds, eggs and chicks) or frequently ashore (i.e. adult kororā incubating eggs, brooding and / or feeding chicks).

4.2.3.1 Airborne Noise Management Procedure

To manage potential effects on nesting or moulting kororā detected during pre-construction surveys (see Section 4.2.1), an airborne noise management approach will be used. This approach will only allow construction activities to occur at locations where sustained airborne noise levels generated from construction are **below 70 dB $L_{Aeq(15\ min)}$ at active burrows** (i.e. burrows occupied for breeding or moulting). One-off or infrequent noise levels generated above 70 dB LAeq(15 min) at active burrows are not of concern. Of concern are sustained noise levels, i.e. noise levels at active burrows that average 70 dB $L_{Aeq(15\ min)}$ (or above) over a 15-minute period or longer; such noise levels will be managed and are addressed in this management plan. A threshold of 70 dB $L_{Aeq(15\ min)}$ is approximately equivalent to 80 dB $L_{Aeq(1\ sec)}$. This threshold is equivalent to the daytime construction noise limits prescribed by the consent conditions and will be revised if better information becomes available.

Determining the setback distance for noise management relies on on-site measurements to ascertain construction-related noise levels at active burrows (i.e. setback distances will be commensurate with the noise level received at active burrows). Appropriate noise mitigation will be implemented as required. As described in Section 6.0, it will be CentrePort's responsibility to provide evidence (i.e. records / proof) that sustained airborne noise levels generated from construction activities have been kept below 70 dB $L_{Aeq(15\ min)}$ at active burrows.

This 70 dB $L_{Aeq(15\ min)}$ setback approach from an active burrow is based on the best information that is currently available in the scientific literature pertaining to noise responses by penguins (Marshall Day Acoustics, 2021e), and is coupled with the fact that kororā are commonly found in highly modified and disturbed areas (e.g. close to railway lines and busy roads), and thereby able to adapt to relatively noisy environments. They are also burrow-nesting (c.f. surface nesting) birds, and the burrows result in some noise attenuation of construction works; this was

[12] Defined as occurring for 15 minutes or longer.

[13] This is mentioned in Table 3 of the Marshall Day, 2021 assessment.

recently investigated in another local project and it was found that noise levels were reduced by approximately 10 dB within a test burrow relative to outside the burrow (Marshall Day Acoustics, 2021d).

To reduce noise levels at active burrows, sound mitigation techniques will be employed. It is recommended to undertake as much practicable mitigation as possible to keep noise levels as low as possible. For example, where practicable noise barriers will be used to shield the impact piling driving hammer. Noise attenuating material may also be laid over the active burrow to decrease the airborne piling noise; for this method, the noise attenuating material would be removed upon completion of the piling works[14]. A 3 m-high noise barrier fence (attenuation mounted on security fences) may also be used to decrease the airborne noise from the crawler crane; modelling has shown that if implemented correctly this can be effective and reduce the number of burrows within the effects zone (refer to Figure 2 for unmitigated modelling and Figure 3 for mitigated modelling) (Marshall Day Acoustics, 2021b, 2021c). Other mitigation measures include operator care to avoid unnecessary noise and ensuring equipment is well maintained. An adaptive management approach will be implemented to manage noise levels (i.e. other sound mitigation techniques will / may utilised) and will be developed in consultation with a suitably qualified and experienced coastal ecologist and acoustics specialist.

Figure 2. Unmitigated predicted noise levels received inside kororā burrows (assuming a 5 dB reduction compared to noise in the air outside) from crawler crane movements.

[14] In no instances will the covering be left overnight to allow penguins to enter and exit the burrows.

Figure 3. Mitigated predicted noise levels received inside kororā burrows (assuming a 5 dB reduction compared to noise in the air outside) from crawler crane movements. The proposed mitigation is a 3 m high noise barrier fence.

Estimated noise reductions and associated setback distances (m) to achieve 70 $L_{Aeq(15\ min)}$ for the different construction activities have been modelled and are shown in Table 1 and Table 2 (Marshall Day Acoustics, 2021e). Note that noise attenuation within active burrows is conservatively shown as 5 dB (not 10 dB) to account for potential differences in attenuation between burrows due to differences in depth, rock size, structure, etc.

Table 1. Estimated setback distances (m) for daily construction activities to achieve 70 dB $L_{Aeq(15\ min)}$ within an active kororā burrow.

Activity	Set-back distance to achieve 70 dB $L_{Aeq(15\ min)}$ inside burrows	Set-back distance to achieve 70 dB $L_{Aeq(15\ min)}$ inside burrows with effective noise barriers (additional 5 dB reduction)
Crawler crane	50	30
Grinders/Power Tools	25	15
Concrete Pump	20	10
Excavator (loading trucks)	15	10
Concrete wire cutting	15	10
Trucks	15	10
Mobile crane	5	5
Generator	5	5
Light tower	5	5

Table 2. Estimated setback distances (m) for works planned to occur outside of the kororā breeding / moulting period to 70 dB $L_{Aeq(15\ min)}$ within an active kororā burrow.

Activity	Set-back distance to achieve 70 dB $L_{Aeq(15\ min)}$ inside burrows	Set-back distance to achieve 70 dB $L_{Aeq(15\ min)}$ inside burrows with effective noise barriers (additional 5 dB reduction)
Large breaker (rock armour)	110	65
Vibro piling	65	35
Hydro demolition	50	30
Concrete/paver cutting	50	30
Impact piling with dolly	50	30
Auger drilling	35	20
Hand breaker	35	20

4.2.3.2 Underwater Noise Management

For nesting penguins, underwater noise is considered less of a problem than airborne noise. This is because penguins generally come to and from their burrows at night when piling works (which creates underwater noise) are not conducted, therefore they will not be disturbed by piling works. For foraging birds, if disturbed from the works area, they have ample alternative habitat in wider Wellington Harbour that they can utilise.

Nonetheless, underwater noise generated from piling works will be managed through use of a bubble curtain and use of a non-metallic ‘dolly’ or ‘cushion cap’ that will be placed between the impact piling hammer and the driving helmet (e.g. plastic or plywood). These mitigation measures will be utilised to manage underwater noise effects on marine mammals as well as penguins and other marine life (Marshall Day Acoustics, 2021a).

No specific underwater noise monitoring is required for kororā.

4.3 Rock Removal / Reinstatement Methodology

Where rocks along the revetment are to be moved using machinery, the revetment within 10 m of the rock removal zone will be surveyed for kororā within 24 hours of works as per Sections 4.2.1 and 6.0. If non-nesting or non-moulting kororā are detected within 10 m of the proposed works, they will be relocated as per Section 4.2.2. If nesting or moulting kororā are detected, the rock movement works within 10 m of the active burrow will not proceed until nesting or moulting activities are completed. Rock removal works greater than 10 m away from the active burrow can occur.

When machinery is used to move rocks, this will be done using a claw attachment so that the rocks can be lifted one at a time so that any incidental burrows discovered within the rock revetment (i.e. burrows not detected during the pre-construction survey) are uncovered progressively and slowly. A bucket attachment may be used for the movement of rocks below MHWS. All rock moving work will be undertaken by an experienced digger driver under the supervision of a suitably qualified and experienced person (i.e. a penguin handler listed in the DOC permit).

For rock moving above mean high water springs (MHWS), once each rock is moved, the area will be inspected by a suitably qualified and experienced coastal ecologist to ensure no kororā are hidden within the rocks. The rocks will then be placed in a suitable location that does not create a workplace hazard. Management measures will be implemented to ensure that kororā do not inhabit the stored rocks. Such measures may include:

- Placement of material such as bidum cloth or tight mesh fabric over the rock storage area; or
- Temporary fencing around the rock storage area.

If the movement of rocks extends over multiple (more than one) days, efforts will be made to discourage birds from being able to access the site overnight (as per above, i.e. placement of bidum cloth (refer to Section 5.0) and temporary fencing). An additional effort may include moving as much rock as possible so that a bare ground surface is exposed thereby leaving no crevices for kororā to occupy.

Where the area of rock removal and /or rock storage is covered or fenced, it is imperative that the material or fencing is securely fastened to minimise the chances of kororā entering the area through a gap.

Just prior to the movement of stored rocks for reinstatement of the rock revetment, the stored rock pile will be inspected by a DOC-certified conservation dog and handler for the presence of kororā. If non-nesting or non-moulting kororā are detected, they will be relocated as per Section 4.2.2. If nesting or moulting kororā are detected, the rock movement works will not proceed until nesting or moulting activities are completed. If the same rocks as those initially removed from the revetment are not used for reinstatement of the revetment then advice will be sought from a suitably qualified and experienced coastal ecologist on appropriate rock sizes to use to reinstate the habitat for penguins. The reinstatement of the rock revetment will be supervised by a suitably qualified and experienced coastal ecologist to ensure that it is done in a manner that will provide suitable habitat for penguins to nest and moult in (i.e. to achieve reinstatement and improvement of the former habitat).

5.0 Kororā Habitat Modification

If works that may have an impact on kororā are to occur during the kororā breeding season and moult period (16 June to 28/29 February), then in the non-breeding season (1 March to 15 June) prior to works being conducted, kororā habitat modification works may occur within the effects zone (defined in Section 2.0). **Prior to this occurring, the effects zone will be minimised as much as possible though the use of noise management so that the area of habitat modification is as small as possible.** For example, habitat modification may occur in the noise mitigated effects zone of the crawler crane shown in Figure 3 in Section 4.2.3 but not beyond this.

Habitat modification works may include, rock removal, infilling and / or netting of potential nesting or moulting habitat. The method of habitat modification that will be implemented will depend on the intricacies of the individual site and will be advised and supervised by a suitably qualified person with penguin expertise in conjunction with the constructor. The method of modification will be discussed with Greater Wellington Regional Council before it is implemented.

Immediately[15] prior to the commencement of habitat modification, a suitably qualified person with a DOC-certified conservation dog will survey the area to check for the presence of kororā. If no kororā are detected, habitat modification will occur immediately[16]. If non-breeding or non-moulting kororā are detected, habitat modification will not occur until the penguin has been relocated to a safe area (as per the guidelines in Section 4.2.2). Given that habitat modification may only occur in the non-breeding and moulting period, it is highly unlikely that an active burrow or moulting penguin will be observed; however given that there can be some variability in the timing of these activities, if an active burrow or moulting penguin is discovered, habitat modification within 10 m of the active burrow will not occur until nesting or moulting is complete.

Habitat modification will be a temporary activity spanning the length of construction. Post-construction, the habitat will be reinstated and improved as per the last paragraph of Section 4.3.

6.0 Kororā Monitoring

Monthly monitoring of kororā using a DOC-certified conservation dog commenced at the project site and adjacent area of rock revetment (which is contiguous with that in the project site (Appendix 3)) on 24 May 2021. This was timed to coincide with the kororā breeding season prior to the start of works (2021-22) to get a better understanding of habitat use within the project site and surrounds. Regular monitoring will continue for the duration of the project to confirm the ongoing habitation of the revetment by kororā during the construction phase of the renewal works and to inform where nesting is occurring so that appropriate construction management methods can be employed (i.e. noise mitigation / setbacks). The monitoring will include a sweep of the works area to detect any new kororā burrows as well as checks of any nesting and / or moulting birds detected during pre-construction surveys (and incidentally during

[15] Defined as occurring on the same day as habitat modification, not the day before.

[16] Defined as occurring on the same day the pre-works survey is conducted.

construction works if this occurs); if such birds abandon their burrows or leave the area, these changes will be investigated relative to the construction activity (by a suitably qualified and experienced coastal ecologist) to determine, as far as is reasonably possible, whether construction activities may be the cause. If required, the construction programme and / or methodology will be adapted in response.

Information recorded during each survey includes:

- Location of dog detection/s
- 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.

A burrowscope or camera is used to assist with identifying burrow contents, and all data is recorded. The location of each dog detection is assigned a number which serves as an individual identifier to enable burrows to be monitored over time. The rock at the entrance to each burrow is marked with dazzle paint and the location is recorded with a GPS and mapped.

During all rock removal works, a suitably qualified and experienced coastal ecologist will also be present to monitor and check for the incidental discovery of kororā (i.e. kororā not detected during the pre-construction survey).

7.0 Collection of Dead Kororā (if found)

If a dead kororā is found within the project footprint, the bird will be photographed and notes taken on the date found, location found and any observations of note (e.g. chick / adult, blood on feathers, missing part of flipper, etc). The kororā will not be moved or handled without DOC approval. The local DOC area office will be contacted to establish whether they wish for a necropsy to be performed to establish the cause of death. If so, a DOC representative, or a person with appropriate approval, will collect the carcass and send it to Massey University's Wildlife Pathology, Gribbles Veterinary or New Zealand Veterinary Pathology. The cost of transporting the specimen and the cost of the necropsy will be covered by CentrePort.

8.0 Habitat Replacement

The areas of rock revetment that will be removed will be reinstated post-construction as outlined in Section 4.3. Likewise, if habitat modification occurs, post-construction this habitat will be reinstated and improved as per the last paragraph of Section 4.3. This process will be supervised by a suitably qualified and experienced coastal ecologist and will be done in a manner that will provide suitable habitat for kororā to nest and moult in (i.e. to achieve reinstatement and improvement of the former habitat).

Although additional habitat replacement and enhancement are not conditions of consent, CentrePort are happy to do so. This may be in the form of installing nest boxes in penguin habitat around Wellington Harbour at a 5:1 replacement ratio, whereby five boxes will be installed for each active burrow lost. CentrePort may also, or alternatively, install a barrier at the

top of the rock revetment within the project area at Point Howard. This will help protect kororā by preventing them from walking onto the carpark and road area. The details of these measures will be discussed with GWRC to determine what is appropriate and reasonable, and if nest boxes are installed, where to do so.

9.0 Reporting

Records and results will be kept of all kororā detected during pre-construction surveys (as described in Section 4.2.1) routine monitoring conducted (as described in Section 6.0) and all kororā relocations (as described in Section 4.2.2.1). Airborne noise management records will also be kept to provide evidence that sustained airborne piling noise has been kept below 70 dB $L_{Aeq(15\ min)}$ at active burrows. This information will be provided to DOC and GWRC on an annual basis.

10.0 Plan Updates

We note that adaptive management is proposed in that management methods, particularly the noise management approach, will be confirmed based on monitoring of piling during set up of the temporary wharf during the non-breeding and non-moulting period (i.e. monitoring of noise levels and the effectiveness of noise mitigation methods) as well as the results other construction works occurring in kororā habitat that are also using this approach. The management approach will not be changed without having conversations with DOC and Greater Wellington Regional Council (GWRC) and if changes are proposed, the plan will be re-submitted to GWRC for approval.

11.0 Roles and Responsibilities

The roles and responsibilities of the Suitably Qualified Coastal Ecologist, DOC and the DOC-permitted kororā handlers are outlined below.

Suitably Qualified Coastal Ecologist: responsible for supervising and advising on kororā management actions for the project as required. This includes: supervising rock removal works; supervising and advising on the reinstatement of rock revetment post-works; determining if kororā burrows within the project area identified during pre-construction surveys are active or not (the status of burrows identified during monitoring will be determined by the DOC-certified conservation dog handler); training onsite contractors to identify signs of kororā habitation, secure work sites and what to do if a kororā is incidentally discovered during works; providing general kororā advice required during construction; and investigating abandoned burrows within the works area to determine the likely cause of abandonment and providing advice on adapting construction methodologies as appropriate.

DOC: responsible for reviewing the Wildlife Act permit application for the project and providing authorisation to capture, handle and relocate kororā.

DOC-permitted kororā handler: a person listed on the Wildlife Act permit for the project and has the authorisation to capture, handle and relocate non-nesting and non-moulting kororā to encountered within construction areas to the Days Bay Penguin Haven release site using the methodology outlined in the DOC permit and Section 4.2.2.1.

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Appendix 1: Section 5.4.1 of the Ecological Impact for the Project

5.4.1 Coastal avifauna

To avoid construction effects on LBPs we recommend that construction works are not conducted during the breeding season and moult period (i.e. they are not conducted between the start of July and the end of February).

If this is not possible or practicable, then we recommend that in the area of rock revetment seawall, pre-repair/construction surveys should be conducted for LBPs. These surveys should be conducted by a suitably qualified ecologist immediately prior to the commencement of works. If LBPs are not detected, then repair works can proceed; if LBPs are detected, appropriate actions should then be implemented to manage effects on the LBPs. For example, if nesting or moulting birds are detected, an exclusion zone should be erected around the nest/bird, in which construction activities cannot commence until nesting/moulting activities are completed.

An alternative method of habitat modification that could be implemented in the LBP non-breeding season prior to works being conducted, is placing man-made material (such as bidum cloth, or tight mesh fabric) from the top to the bottom of the rock revetment to stop LBPs from using potential nesting/moulting habitat along the revetment. This process would need to be supervised and directed by a suitably qualified person and immediately prior to modification, a suitably qualified person with a DOC-certified conservation dog would need to survey the area for the presence of LBPs. If no LBPs are detected, modification would need to occur immediately. If a LBP is detected, modification would not occur until the penguin has been relocated to a safe area (providing it is not nesting).

A LBP Management Plan should be prepared by a suitably qualified and experienced person that outlines what needs to be implemented to avoid or manage potential impacts on this species. This may include, among other things, methods to conduct LBP surveys prior to redevelopment works (if this occurs during the LBP breeding season), actions to undertake if penguins are found, and recommended methods and rock sizes for re-construction of the revetment so that it remains suitable habitat for penguins to nest and moult in.

To accompany this, a Department of Conservation Wildlife Act Authorisation (permit) application will need to be prepared to enable handling of LBPs if required as part of LBP management during the rock revetment redevelopment works.

Appendix 2: Little Blue Penguin Detections / Burrow Locations

Boffa Miskell

www.boffamiskell.co.nz

0 60 m

1:2,500 @ A3

Data Sources: Holmes Consulting, BML, Basemap: LINZ, Eagle

Projection: NZGD 2000 New Zealand Transverse Mercator

SEAVIEW WHARF REPLACEMENT: ECOLOGICAL ASSESSMENT

Nesting Birds

Date: 28 July 2021 | Revision: 0

Plan prepared for Centreport Limited by Boffa Miskell Limited

Project Manager: Leigh.Bull@boffamiskell.co.nz | Drawn: KMa | Checked: KSi

Appendix 2

Appendix 3: Little Blue Penguin Fortnightly Monitoring Location

Boffa Miskell

www.boffamiskell.co.nz

0 60 m

1:2,500 @ A3

Data Sources: Holmes Consulting, BML, Basemap: LINZ, Eagle

Projection: NZGD 2000 New Zealand Transverse Mercator

SEAVIEW WHARF REPLACEMENT: ECOLOGICAL ASSESSMENT

Little Blue Penguin Fortnightly Monitoring Location

Date: 28 July 2021 | Revision: 0

Plan prepared for Centreport Limited by Boffa Miskell Limited

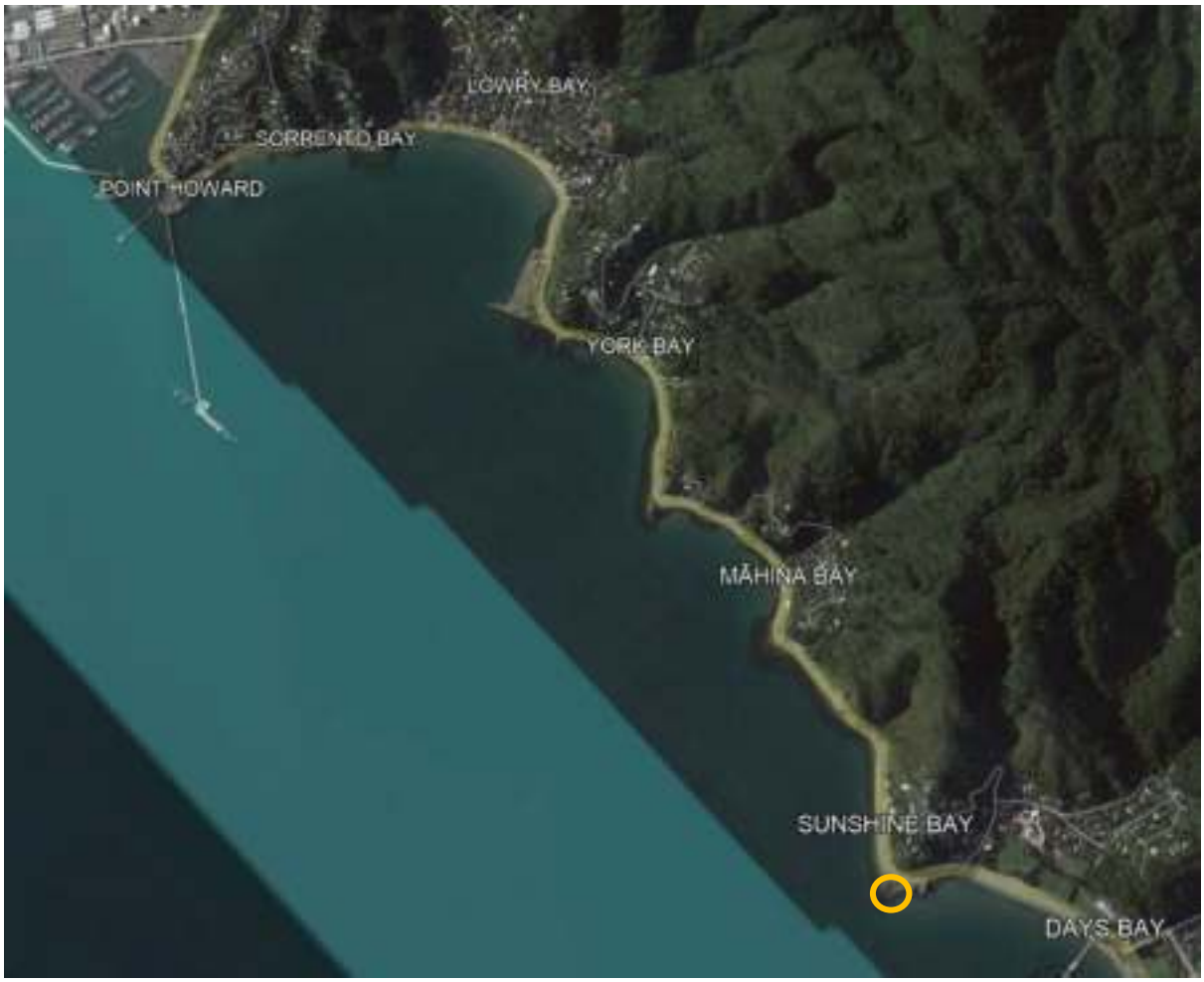
Project Manager: Leigh.Bull@boffamiskell.co.nz | Drawn: KMa | Checked: KSi

Appendix 3

Appendix 4: Little Blue Penguin Release Location

Appendix 4: Little Blue Penguin Release Location and Release Protocol

The orange polygon indicates the location of the Days Bay Penguin Haven release site.



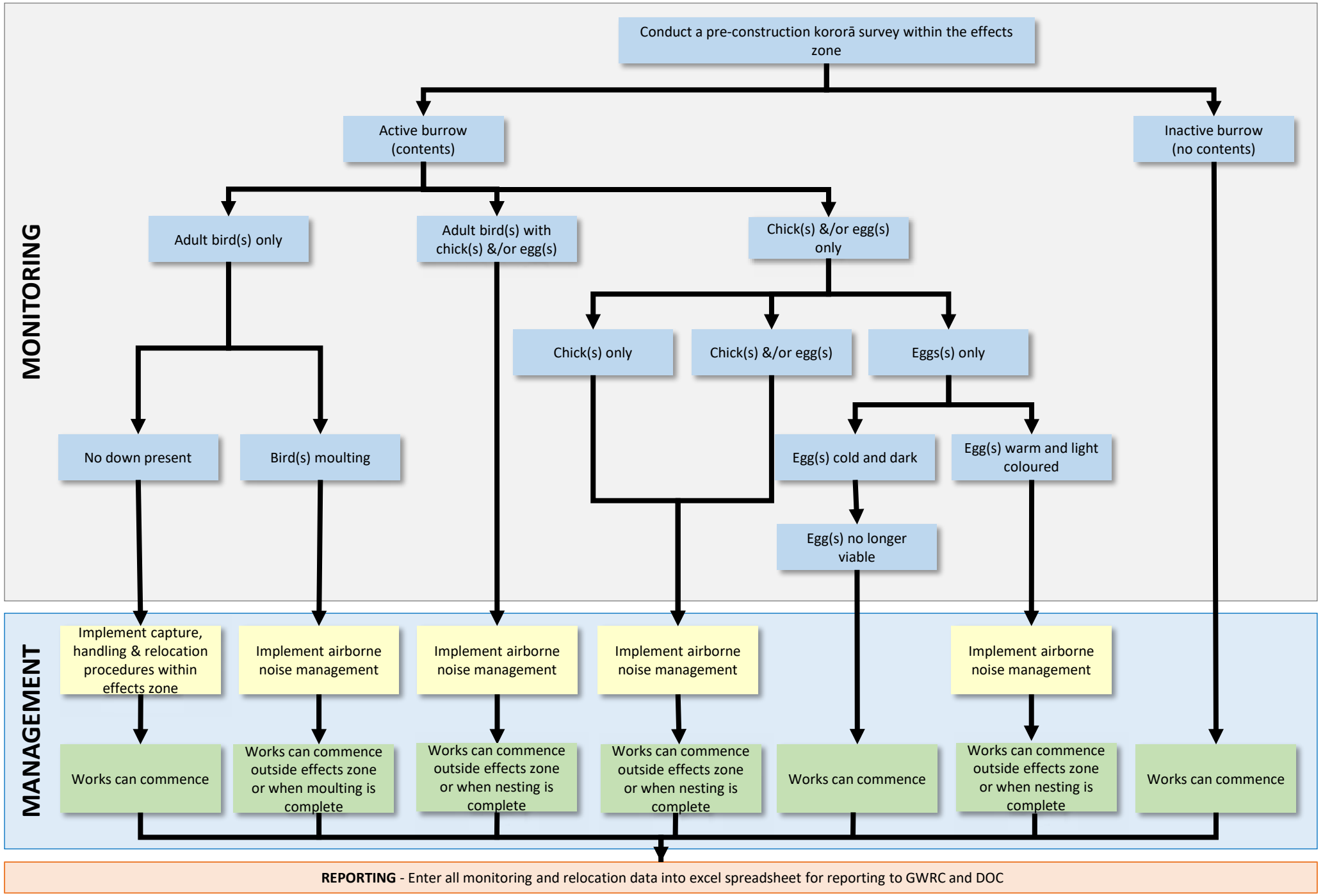
Release Protocol

The Days Bay Penguin Haven is fenced and locked and a key is required to access the site. Hutt City Council has a key as does Mike Rumble (local penguin expert). When a penguin requires relocation, Mike will be called in the first instance for access to the release site. If he is unavailable Brent Tandy from DOC will be called and if neither are available, then an approved penguin handler (a person listed in the DOC permit) will pick up the key from Hutt City Council (HCC) providing that they are happy to supply a key for use. This process and the appropriate contact person at HCC will be confirmed prior to the commencement of works on site. In the absence of Mike or Brent for release, the penguin/s will be put into one of two pre-determined penguin boxes at the release site. The location of these boxes will be shared with the approved penguin handlers for the project prior to the commencement of construction works. The boxes will be marked and the entrance to these boxes will be blocked up in anticipation of birds being translocated from Seaview (the purpose of blocking the nest boxes up is to prevent other penguins from using the nest boxes and thereby leaving space available in which to release birds). Upon release, the nest boxes will be opened up to allow the penguins to disperse as they please.

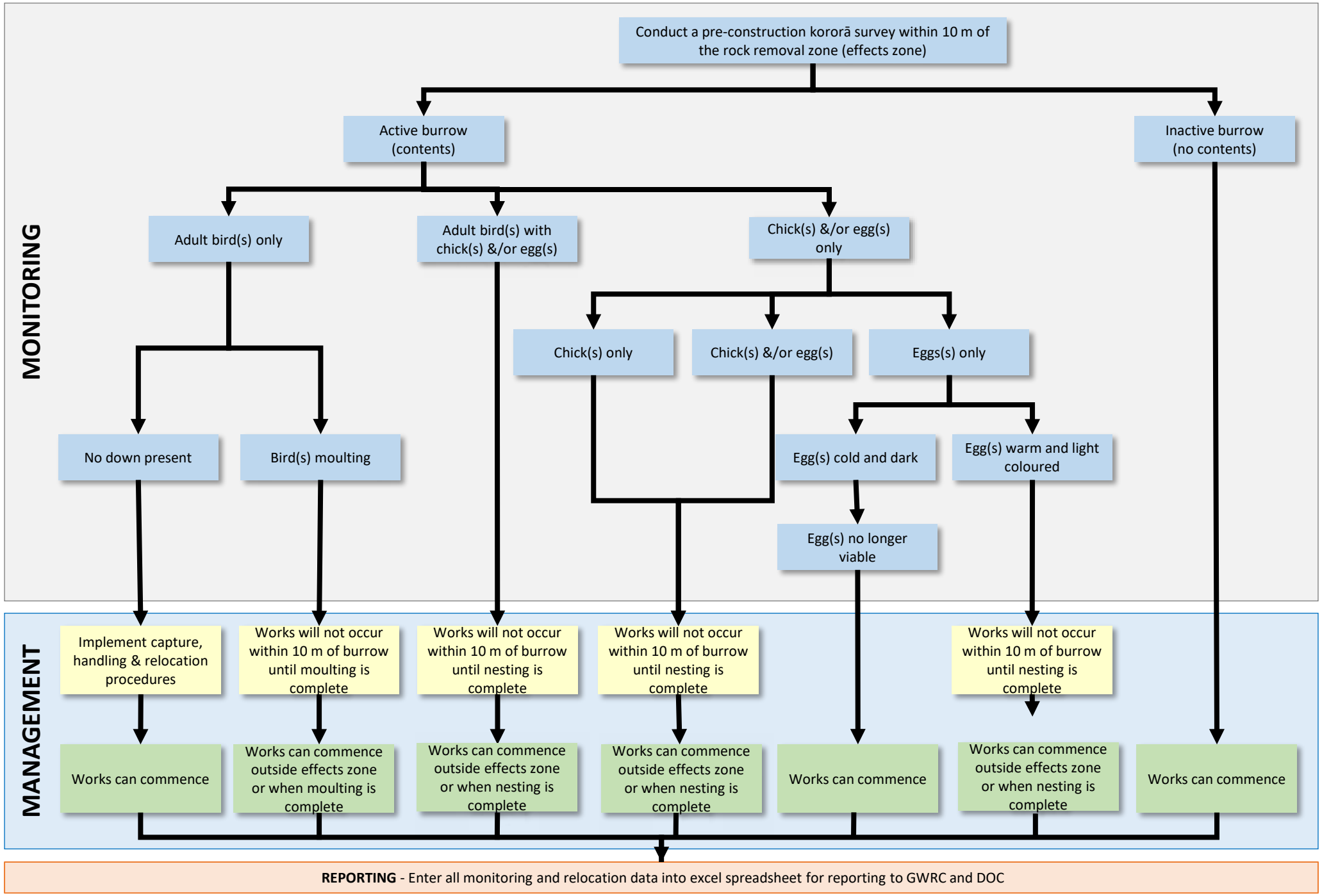
Appendix 5: Construction Management Summary

Note that works will be prioritised to occur during the kororā non-breeding and non-moult periods and that these management actions will only occur if this is not possible.

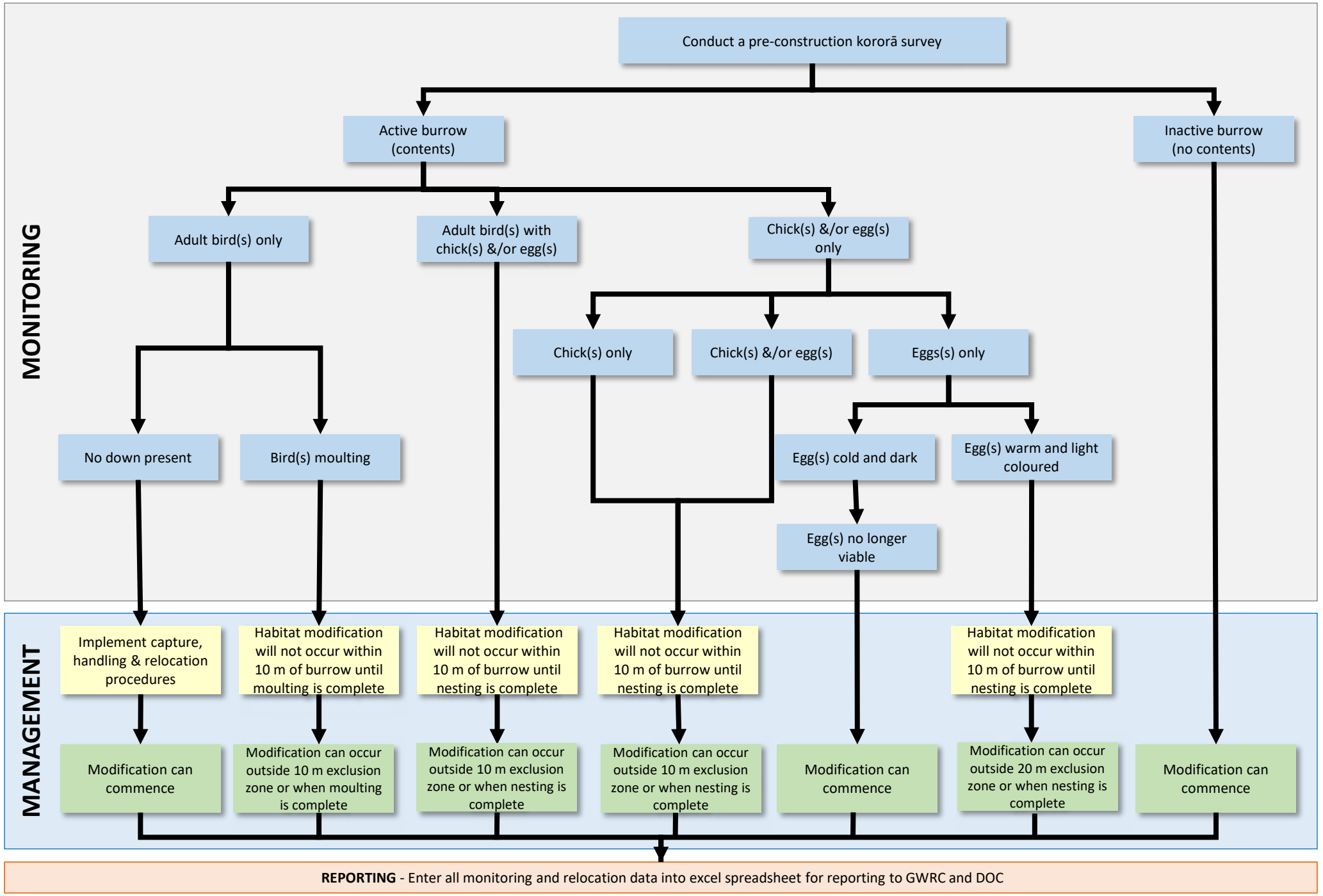
PILING & COMMENCEMENT OF SITE COMPOUND, STAGING PLATFORM & ABUTMENT WORKS



ROCK REMOVAL



HABITAT MODIFICATION



ROCK REVETMENT REINSTATEMENT