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WHARF

Ngā Manu - AVIAN MANAGEMENT PLAN

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25 (a)	Page 13 – 17: Mitigation actions – pre-construction and during construction
25 (b)	Page 17: People involved and Appendix 6 – Wildlife Authority Permit
25 (c)	Page 18: Achieving no net loss
25 (d)	Page 19 – 21: Other bird species
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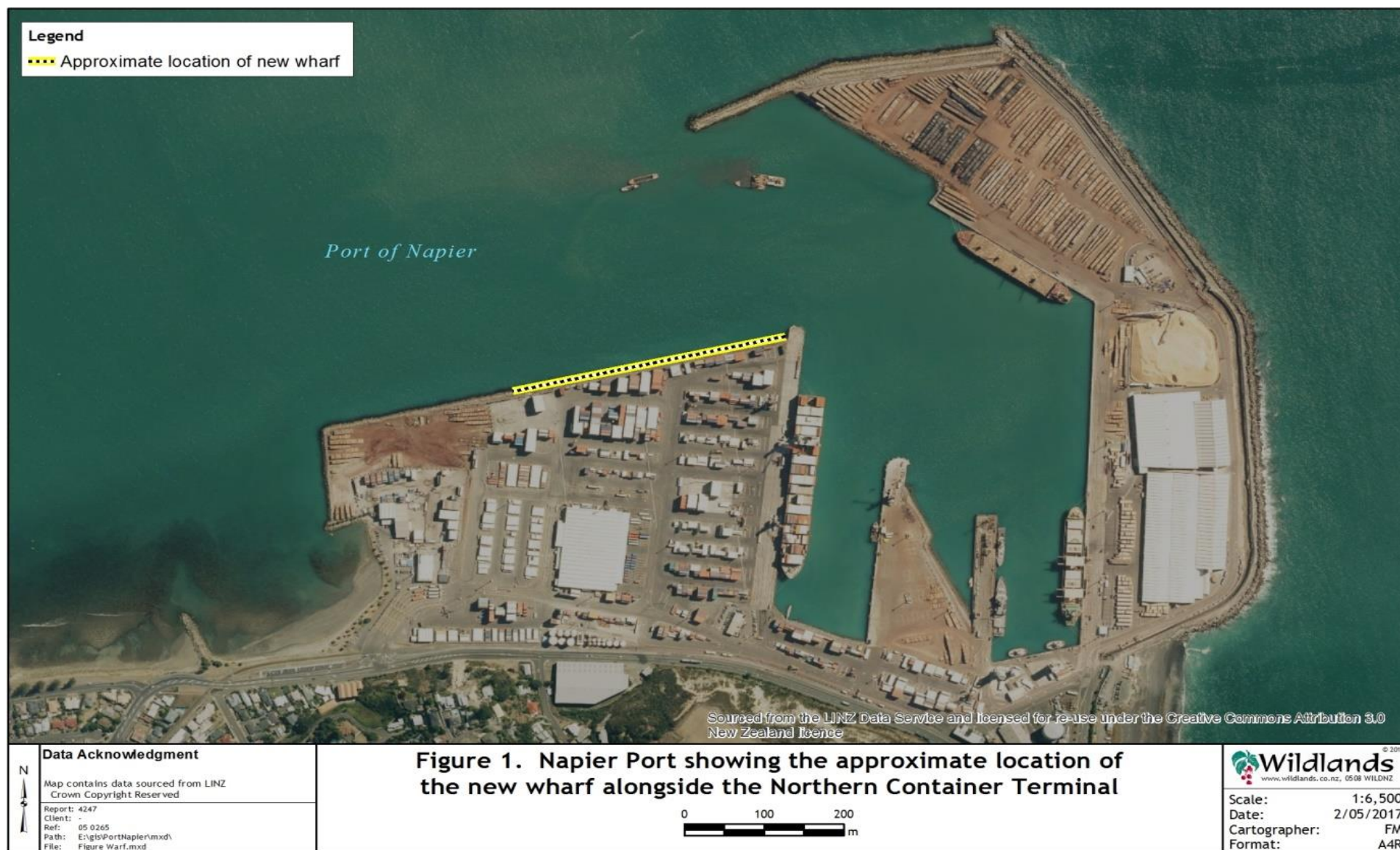
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1. INTRODUCTION

Napier Port has been granted resource consent to construct a new wharf along the existing edge of the Northern Container Terminal (Plate 1, Figure 1). The new wharf will be approximately 34 metres wide and 350 metres long, and will provide additional berthage. The location of the wharf and an adjacent berth will be dredged to a depth of 14.5 metres prior to construction. Construction and dredging are likely to be completed over a period of approximately 24-30 months. During this time, approximately two thirds of the revetment or seawall along the northern edge of the Northern Container Terminal will be dismantled and driving of some 380 piles will create extensive noise.



Plate 1: Location of proposed new wharf showing the northeast end of the affected revetment at left foreground (credit: Napier Port).



The proposed works will directly affect a population of little penguin (*Eudyptula minor*; At Risk-Declining¹). Approximately 30 pairs of blue penguins breed within the section of revetment that will be dismantled². As a result of construction, all burrows will be lost. It is likely that the new revetment will be unsuitable for nesting as it is significantly lower than the existing revetment, and located entirely beneath the proposed wharf. The loss of existing burrows is a permanent and major adverse effect of the proposal. The loss of burrows will be offset by the development of a nest box colony on a section of wharf adjacent to the existing revetment.

Prior to construction, attempts to remove all affected birds will be undertaken. Nevertheless, during deconstruction, the dismantling of the revetment may expose remaining nests with eggs, chicks, and/or incubating, resting, or moulting adults. It is possible that eggs, chicks or adults may be harmed during this process.

The construction of the wharf also has the potential to disturb shags that roost on the main breakwater and breakwater spur. Other species such as white-fronted terns (*Sterna striata*; At Risk-Declining) have nested on Port seawalls in the past and, if they do so again, may also be disturbed by wharf construction.

2. SUMMARY OF PROPOSED MANAGEMENT PLAN

Resource consent conditions for construction of the new wharf require the development of an Avian Management Plan which aims to minimise adverse effects on bird populations, specifically little penguin, but also other bird species of conservation concern. The primary goal is to achieve no net loss of little penguins in the vicinity of Napier Port over a 10-year period following commencement of construction. The full consent conditions for CL180008C conditions 25 and 26 are appended as Appendix 1. This Avian Management Plan has been developed to meet the terms of consent, and will form the basis for future protection and enhancement of the little penguin population once consent has lapsed.

The following is a summary of the Avian Management Plan.

Little penguin

1. Survey and monitoring of the little penguin population at Napier Port and surrounds, pre-construction, during construction and post-construction.
2. Pre-construction: Development of a nest box colony within Napier Port to offset the permanent loss of nests, and provide the opportunity for extensive research of the local population.
3. Pre-construction: Partial deconstruction of the revetment to uncover burrows in the presence of a person with relevant experience tasked specifically with monitoring and handling penguins, activation of penguin action plan to appropriately deal with burrow contents, and reconstruction of the revetment with a net wrapping to stop penguins re-entering. This 'methodology confirmation' is to occur in April-May 2019 to ensure its feasibility and to inform the ongoing management of the little penguin population.
4. Construction: Checking for penguin use prior to revetment deconstruction, re-wrapping revetment at the end of each day, daily checking and maintenance of rock and building material stockpiles to ensure absence of penguins.
5. Description of method to evaluate if the goal of 'no net loss' of little penguins 10 years post-construction has been achieved.
6. Description of alternative options for little penguin management if 'no net loss' cannot be achieved.

¹ Threat classifications for birds are from Robertson *et al.* (2017).

² A seabird conservation dog made 34 indications along the revetment in 2018.

Other bird species

7. Pre-construction, construction and post-construction monitoring of shags on breakwater spit, pre-construction monitoring of the affected revetment.
8. Recording and monitoring of nesting attempts of black-billed gulls (*Larus bulleri*; Threatened-Nationally Critical), red-billed gulls (*Larus novaehollandiae*; At Risk-Declining) and white-fronted terns.
9. Development of a nest box colony to support shag roosts if monitoring indicates value, and possibly gull and tern colonies if this does not encourage aggressive behaviour towards Port staff, and is compatible with penguin management (which is the priority).

3. MANA WHENUA ENGAGEMENT

A partnership with mana whenua hapū was formed during the consent application process. Engaging and fostering of this relationship resulted in a series of hui-a- hapū.

A cultural impact assessment report capturing the aspirations of mana whenua hapū was developed, along with the desire for cultural monitoring and information sharing. The Cultural Impact Assessment accompanied the resource consent application for the 6 Wharf Project. This assessment introduced the basis of a Marine Cultural Health Programme.

Consent was granted following the Hearing and presentation of submissions. There were no appeals to the Environment Court, and the consent 'came into effect' in November 2018.

In March 2019, a Pou Tikanga – Environmental and Cultural Advisor joined Napier Port, and established a Mana Whenua Steering Komiti. The Advisor will be working in partnership with the Mana Whenua Steering Komiti having specific regard to the environmental and cultural aspects of the 6 Wharf Project, including the Ngā Manu - Avian Management Plan.

A summary of the Ngā Manu - Avian Management Plan was provided at the inaugural Marine Cultural Health Programme Hui conducted on the 10 April 2019 and 07 May 2019.

The following recommendations have been endorsed:

- Research working with Massey University;
- Research with whānau and kaumatua regarding matauranga of kororā and taonga manu species within the project area;
- Kaitiaki monitoring of Kororā when required;
- Pou and waharoa entranceway to the penguin colony, design of kororā boxes;
- Wananga with whānau, at penguin sanctuary on kororā and/or regarding other taonga manu species; and
- A penguin box for each mana whenua to design.



4. LITTLE PENGUIN – KORORĀ

4.1 BACKGROUND

4.1.1 POPULATION STATUS

Kororā or little penguin are found along the entire New Zealand coastline³. The species is classified as At Risk-Declining as they are thought to have large but declining populations (Robertson *et al.* 2017).

The size of the Hawke's Bay little penguin population is not known. Little penguins have been reported at Napier Port, Cape Kidnappers, and Motu-o-kura or Bare Island. Each of these sites is likely to have low predation pressure due to pest control at Cape Kidnappers and the Port, and lack of predators on Motu-o-kura (Walls 1998).

4.1.2 NEST LOCATIONS

Little penguins are widespread around the New Zealand coastline, breeding in colonies or sometimes singly. Colonies are generally small, numbering only a few pairs. The largest colonies include the Oamaru population that comprises more than 1,000 individuals (Flemming 2013). Birds can be found nesting some distance inland, and in virtually any habitat, including coastal dunes, scrub and forest, farmland, and residential areas (Marchant and Higgins 1990).

Birds breed in a wide variety of burrow types, sometimes digging their own, or commandeering the burrows of other birds (such as sooty shearwaters; *Puffinus gavia*), but also using logs, caves, crevasses in rocky shorelines, spaces under houses, underneath dense vegetation, and in specially-made nest boxes. At Napier Port, penguins nest within the revetments, but have also been found on the Port wharves, in pipes and log stacks, under containers, and between sheets of plywood. Penguin burrows are used throughout the year, and the same nest site is often used year to year.

4.1.3 BREEDING CYCLE

The breeding cycle of little penguin is shown in Table 1. Dates can vary between locations. In some instances, egg laying can occur as late as December, resulting in a protracted breeding season.

Table 1: Indicative breeding cycle of little penguins, based on Flemming (2013) and Dann (2013).

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Burrow occupation												
Egg laying												
Guarding young												
Moulting												

During April and May, burrows may still be occupied by little penguins. This period has been identified as a possible time in the breeding cycle when burrows may be unoccupied.

Moulting usually occurs after breeding has been completed. During this period of 2-3 weeks, the loss of waterproofing means that an adult bird cannot enter water. After moulting, the birds undertake

³ A recent suggestion based on genetic research is for *Eudyptula minor* to be split into two species (Grosser *et al.* 2015).

extensive foraging trips which can last for more than a week before they return to their burrow. Prior to the onset of breeding, a pair will remain in the nest together for about five days, approximately 30 days before the first egg is laid. The pair then return to the sea for a number of days before returning and remaining ashore for another five days, at which point the first egg is laid.

Little penguins usually lay two eggs which are incubated by both the male and female in stints of 1-10 days. Incubation lasts approximately 35 days. Chicks fledge at 7-9 weeks. Pairs may re-lay if clutches fail, and sometimes begin a second nest after successfully breeding.

4.1.4 FORAGING

Little penguins are known to travel significant distances from the colony when foraging, for example, more than 45 kilometres (Hoskins *et al.* 2008; Preston *et al.* 2007). Mean maximum distances are generally considerably less (e.g. 16.9 to 19.8 kilometres from three colonies in Bass Strait, Australia; Hoskins *et al.* 2008). Most recently, individual little penguins with GPS loggers from Motuara Island in the Marlborough Sounds were found to travel distances of up to 214 kilometres from their burrows during foraging trips (as far north as Taranaki), whereas some individuals remained in local waters (Poupart *et al.* 2017).

Little penguins are typically demersal divers - feeding on the sea bottom - and are thought to use the seabed to trap their prey (Chiaradia *et al.* 2007). They have been shown to dive to 55 metres, but generally feed in shallower waters (e.g. Chiaradia *et al.* 2007; Hoskins *et al.* 2008). The few dietary studies undertaken in New Zealand indicate that the species takes a variety of inshore species of small fish and squid (Flemming *et al.* 2013; Fraser and Lalas 2004; van Heezik 1990).

4.1.5 THREATS

Little penguins are potentially affected by a wide variety of threats and perhaps the most widely recognised is posed by introduced predators. Predators such as cats (*Felis catus*), dogs (*Canis familiaris*), ferrets (*Mustela furo*), and stoats (*Mustela erminea*) can prey on eggs, chicks, and adult penguins, while rats (*Rattus* spp.) may prey on eggs. The impact of particular pest animals appears to vary between sites. For example, white-flipped penguin populations at Flea Bay and Stony Bay, Banks Peninsula, were thought to be most affected by ferret predation (Challies and Burleigh 2004). Rats were considered to have been responsible for egg predation in some populations (Stahel and Gales 1987; Perriman and Steen 2000). Conversely, an analysis of 229 cat scats found little penguin to be among the most common dietary items (Karl and Best 1982). Cats were also considered to have had a major impact on some penguin populations in Australia (Stahel and Gales 1987; Stevenson and Woehler 2008) and at some locations “numerous observations” of cats with penguins in their mouths were recorded. However, cats were thought to have minimal impact on penguins on Phillip Island, Australia (Dann 1992), and are not considered to be a threat at Oamaru (D. Houston, Department of Conservation, pers. comm., 2017). Lastly, a study on the West Coast found predators had minimal effect on penguin breeding success (Heber *et al.* 2008).

Perhaps the most striking reports of predation have been those resulting from dogs. A population at Cape Foulwind was decimated by dogs over a few nights, losing 22 adults^{4,5}. Another population at Little Kaiteiteri Beach lost 12 adults to dogs (B. Vander Lee, Department of Conservation, pers. comm., 2014). In both instances, the predator involved was confirmed by veterinarians. At Little Kaiteiteri, the mortality may have reduced the local population by half or more (RKM, pers. obs.).

⁴ <http://predatorfreenz.org/staunch-penguins-match-stoats-not-dogs/> (downloaded 12 April 2017)

⁵ <http://www.stuff.co.nz/environment/7183183/Dogs-savage-precious-blue-penguin-colony> (downloaded 12 April 2017).

Little penguins are also vulnerable to collisions with vehicles when they cross roads to obtain access to breeding areas. In some areas, mortality may be significant, such as on the West Coast, where Heber *et al.* (2008) recorded 15 road-killed adult little penguin in their study area between August and December 2006. On Phillip Island, Australia, vehicles were estimated to kill 180 penguins annually, until traffic management measures were introduced (Dann 2013).

The possible effects of climate change on little penguins have been relatively well researched in Australia, with authors identifying both positive and negative effects resulting from sea temperature increases (references in Dann 2013). In early 2018, high levels of mortality of penguins were reported, particularly from northern areas of New Zealand; Department of Conservation seabird expert Graeme Taylor suggested a rapid change from an El Niño period to a La Niña event caused major food supply changes, resulting in mass mortality of newly fledged birds⁶.

Other threats include encroachment of coastal developments into breeding areas, as well as increased activities within marine areas, and pollution, particularly oil spills (for example, the wreck of the *Rena* resulted in 383 oiled penguins being admitted to a wildlife facility for rehabilitation, and 90 dead oiled penguins being collected; Sievwright 2014; Riddell and Kessels 2013).

4.1.6 PENGUIN HABITATS AT NAPIER PORT AND SURROUNDS

On 24 September 2017, a penguin survey was undertaken along the revetment to be deconstructed. The survey was conducted by a specialist conservation dog, Rua, trained to detect seabirds, and Rua's handler, Joanna Sim (DabChickNZ). In addition to the affected revetment section, potential habitats to the west and along Hardinge Road were also surveyed. From 10-12 September 2018, the survey was repeated using the same dog, and extended to further areas around Napier Port, and a longer section of Hardinge Road. The detection locations are shown in Figure 2, and the numbers of detections (considered to signify a burrow) are summarised in Table 2.

In summary, 29 and 34 detections were recorded in September 2017 and 2018 respectively within the revetment to be deconstructed, which is the densest population of penguins at the Port of areas surveyed to date. It is possible that not all detections represent active burrows, for example, some burrows may have more than one entrance, or a burrow may be occupied by a single bird. However, the detections can be considered to represent a breeding population of c.80 little penguins within the wider Port area and surrounds. The location of detections within the Port have been recorded by GPS and indicated by paint on the revetment rocks. Actual burrow entrances were able to be identified in many cases from the presence of penguin droppings, and in some cases, penguins were visible or heard.

⁶ https://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=12033683

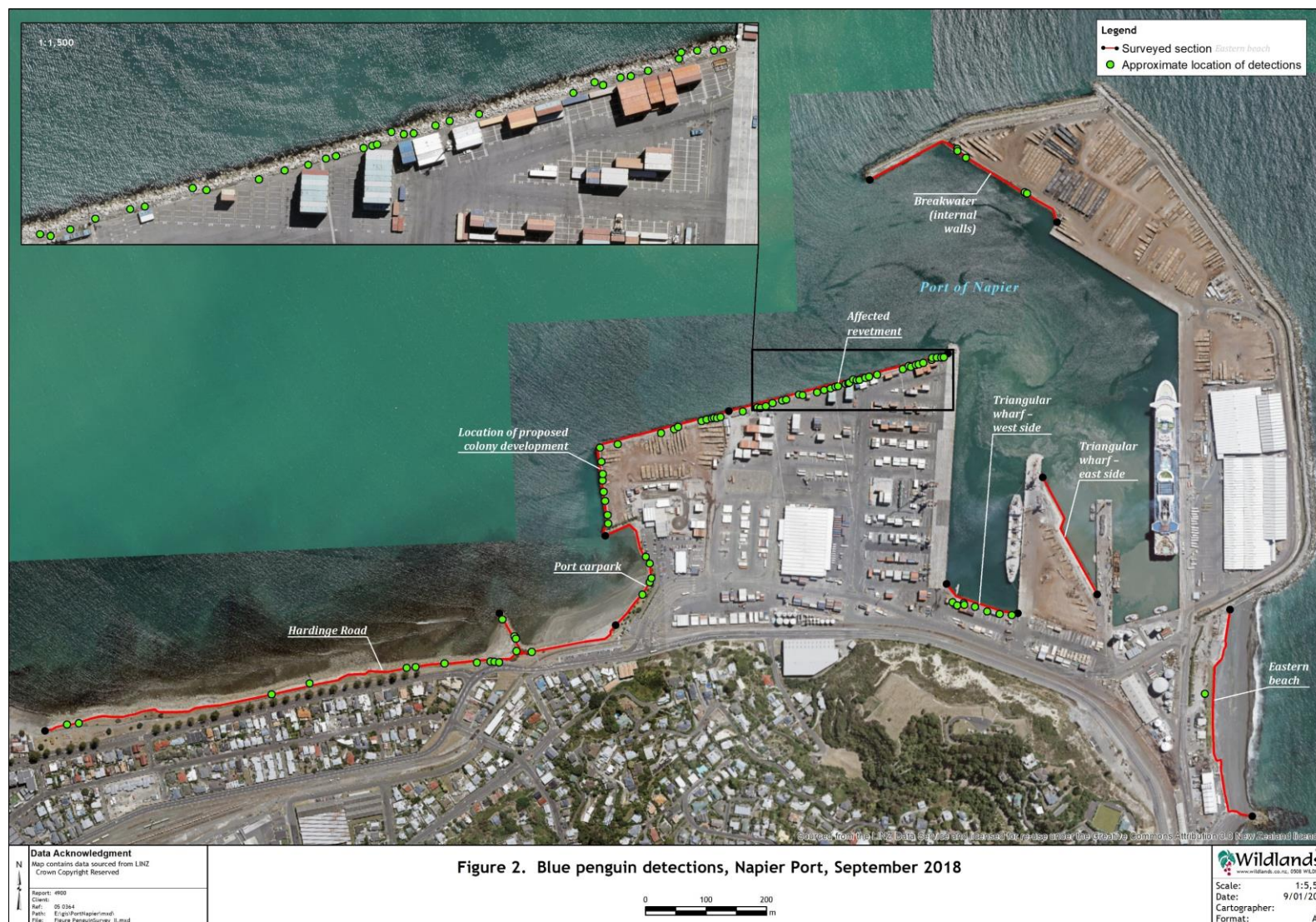
Table 2: *Survey locations and numbers of penguin nest sites/detections, east to west. Napier Port, September 2017 and 2018.*

Survey Location	Number of Detections 2017	Number of Detections 2018
Eastern beach	Not surveyed	1
Breakwater (internal walls)	Not surveyed	5
Triangular wharf – east side	Not surveyed	0
Triangular wharf – west side	Not surveyed	8
Affected revetment	29	34
Proposed colony development	21	17
Port carpark and Hardinge Road	20	21

A number of wharf areas were not surveyed for health and safety reasons. Limestone revetment is present along most of the internal walls of the Port; however, large extents of revetment are underneath wharves. These areas are largely covered by high tides, and are not considered to be suitable for burrows. Only revetments that extend above wharf surfaces are likely to contain burrows.

The external walls of the breakwater (eastern and northern faces) were not surveyed for health and safety reasons. The breakwater is also a limestone revetment, but is comprised of much larger cuboid boulders, and is considerably wider than other revetments at the Port. It is not known whether penguins nest in the breakwater, but it is likely. It may potentially provide the greatest area of breeding habitat at the Port; however, it experiences significantly rougher sea conditions than other revetments, so may not be a preferred habitat (see Section 4.3).

Little penguins are also regularly found in non-revetment locations at the Port, including under container stacks, in pipes, and under log stacks.



4.2 MITIGATION ACTIONS

4.2.1 DEVELOPMENT OF THE NAPIER PORT PENGUIN COLONY

Napier Port has set aside an area of the Port for the development of a little penguin colony consisting of wooden nest boxes. This area is located adjacent to the affected revetment on the western side of the Northern Container Wharf (refer Appendices 2 and 3). The proposed area is approximately 75 metres in length and 10 metres wide, and construction began in late February 2019. The revetment fronting the new colony area presently supports approximately 4-5 little penguin burrows.

The purpose of developing a new colony on the Port will be to directly offset the permanent loss of c.34 blue penguin burrows in the affected revetment. It will also allow for the salvage and transfer of affected penguins to the nest boxes prior to construction (see Section 4.22).

The development of the new colony within the Port environment will also have significant additional benefits. It is proposed that the new colony will initially consist of approximately 60 nest boxes. Concentrating management within the Port will allow the benefits of the existing Port pest control operations to cover the new colony as well, within an area that already effectively excludes dogs, one of the most significant land-based threats to penguins.

Furthermore, nest boxes have been shown to have greater success than natural burrows (Perriman and Steen 2000). If nests within the revetments are significantly influenced by big seas or rainfall, for example, the nest boxes may provide higher quality breeding locations.

As part of a wider education campaign, 24 nest box kits have been provided to Napier Central School, 15 to local iwi, and the remainder will be constructed by Napier Port staff and families or other schools (design in Appendix 4).

The Napier Port Penguin Colony has been designed to enable both little penguin research and advocacy. Professor John Cockrem, Massey University, has drafted a preliminary concept design for a nest box colony, based on the Oamaru colony⁷, attached in Appendix 3⁸. In summary, the colony will have a high fence between it and the Port, and a low fence between it and the revetment, effectively containing the colony and shielding it from Port activities. The colony will be accessed by a penguin ramp, which will allow easy access to the colony for penguins, but also enable penguins' movements to and from the colony to be monitored as part of long-term research (see Section 4.2.4). The colony will be landscaped with two parallel earth mounds (see Plate 2), covered with topsoil, hydroseeded, and planted in grass and small shrubs to provide shade and shelter for nest boxes. The concept design allows for future development of visitor areas for viewing. A conduit has also been installed for any future monitoring of penguins and also a transponder reader at the entrance of the ramp. The intention is to complete all planting by the end of March.

⁷ <https://www.penguins.co.nz/> is the website of the Oamaru blue penguin colony, a nest box-based colony, now a major tourist attraction and self-funding its own research. The website gallery provides pictures of the nest boxes in situ.

⁸ Note that the area shown in the concept design has been reduced since it was drafted.



Plate 2: The site of the Napier Port Penguin Colony looking south towards Bluff Hill. The existing revetment is on the right. Concrete blocks will form the basis of earth mounds (see Plate 3).



Plate 3: After topsoil placement and hydroseeding. Final completion includes trenching of water and power to the colony, construction of the ramp, fencing, and planting. This will be completed by the end of May 2019.

4.2.2 MANAGEMENT OF AFFECTED LITTLE PENGUINS PRE-CONSTRUCTION

The purpose of this stage of work is to reduce numbers of resident little penguins in the affected revetment as much as possible prior to the start of construction. This is to minimise the possibility of disturbance of, or harm to, breeding adults and nests during revetment deconstruction. In summary, this process involves the temporary deconstruction of the revetment at the end of the 2019-2020 breeding season, the transfer of any moulting adults or remaining chicks to the nest box colony, and the reconstruction of the wall wrapped in netting to stop any penguins from re-establishing burrows.

This is likely to be a novel undertaking in New Zealand. However, a similar, though substantially smaller, development in Australia also required management of the resident little penguin population. The construction methodology, penguin 'Action Plan', and outcomes of the St Kilda Breakwater Development are very relevant to the Napier Port development (Kowalczyk *et al.* 2013).

The 'Action Plan' developed by Port Phillip Ecocentre, Melbourne, is reproduced in Appendix 5 with minor changes. Prior to the commencement of temporary deconstruction at Napier Port, this action plan will be fully adapted for the Port as a standalone document to guide onsite penguin management, including personnel, contact details and so on.

Summary of proposed method:

- Partial deconstruction of the revetment, or 'methodology confirmation', will be undertaken in May 2019. The revetment will be reconstructed with a net wrapping to stop penguins re-entering. This work will ensure the feasibility of the methods, and will inform the ongoing management of the little penguin population. Any penguins present will be released into the sea.
- A third baseline survey of the affected revetments and surrounds will be undertaken in September 2019. Sites where the conservation dog indicates will be checked over the following days and months to assess breeding activity.
- Temporary deconstruction is proposed for January-April 2020. Monitoring of activity in revetment burrows will indicate the most appropriate time to start deconstruction, that is, when most, ideally all, of the breeding attempts are complete. Moulting adults are likely to be present in burrows. Older chicks may be present. Incubating adults, or young chicks are unlikely, but cannot be ruled out.
- Initially, 100-200 metres of revetment will be partially deconstructed, starting from the western end. This is the length where the final deconstruction will be undertaken in the first year, starting in approximately May 2020 (the final 100 metres will be completed in the second year). All deconstruction work will be attended daily by a person whose job is to monitor the welfare of the penguins, advise construction workers, and handle penguins when necessary.
- Known burrow locations will be carefully checked prior to that section's deconstruction, using a burrowscope where necessary if burrows are deep. If birds are found, management will follow steps in the 'Penguin Action Plan' (see Appendix 5).
- After removal of accessible birds, a digger and highly experienced digger driver will carefully remove the top layer of revetment rocks⁹ to expose penguin burrows, with input from the penguin monitor. Any further penguins uncovered will be treated as above.

⁹ Removal of revetment rocks has already been undertaken at Napier Port for drain-laying, and was able to be done precisely, and without dislodging other rocks. However, experience from the St Kilda Breakwater Development indicates that movement of rocks can be unpredictable at times.

- If a person is present with a permit to insert microchips into little penguins, the bird(s) will be tagged, then either released into the water or transferred to the nest box colony¹⁰.
- The digger will cover a section of revetment over several days. All large limestone boulders will be removed above the high tide mark and stockpiled on top of the wharf or adjacent area. These will need to be covered at the end of each day to stop penguins from entering.
- Underlying the boulders is much finer crushed limestone which is unlikely to support nests. Once the section is considered free of penguin burrows (this should be checked by an independent observer with suitable expertise, such as someone from the Department of Conservation), the boulders will be replaced and wrapped with fine netting to stop penguins from re-establishing burrows in the revetment. This netting must be sufficiently fine to avoid entangling birds such as gulls, terns and shags that might attempt to roost on it. The covered revetment will be checked regularly to ensure the covering remains in good condition, and there are no issues with entanglement. Camera traps could be used to examine the possibility of use by penguins at night, and other birds during the day.
- Any birds transferred in boxes to the new colony will be monitored as per the Action Plan.
- This process will be repeated in 2021 for the final section of affected revetment.

Key risks and risk management:

- **Risk:** It is possible that new burrows will be occupied between the 2019 survey and deconstruction. It is also possible that the conservation dog will not find some of the burrows that are present.

Management: All the revetment will be treated as if little penguin burrows may be present during temporary deconstruction.

- **Risk:** Most burrows marked in the 2018 survey are considered to be close to the surface. However, some may be considerably deeper, and it may not be possible to extract birds by hand.

Management: Monitoring of these burrows using a burrowscope during the 2019 breeding season will identify the stage of breeding. Temporary deconstruction should be timed to take place after fledging. Deconstruction will be undertaken carefully.

- **Risk:** Birds transferred to nest boxes abandon the box. Little penguins have strong homing tendencies, and this may be a significant risk.

Management: Birds should not be able to return to the affected revetment as it is covered. The insertion of transponders into transferred individuals will indicate where the bird has shifted, if it is found at a later date.

- **Risk:** If a penguin is present during deconstruction because it has not been previously identified, or because it cannot be removed, injury or mortality is possible, despite all attempts to minimise the chance of this occurring.

Management: The St Kilda Breakwater Development report describes a small number of incidents in detail. The Napier National Aquarium and Wildbase Hospital veterinarians will be notified of work programme. If injury occurs, work will stop, and the individual bird will be assessed and taken into care if necessary. Before work recommences, methods will be reviewed, in consultation with the Department of Conservation. If rocks cannot be removed precisely, work will stop and methods will be reviewed.

¹⁰ All adults captured will be marked with microchips using subcutaneous implantation at the base of the neck by a permitted practitioner (John Cockrem or another person). Each bird will be measured (weight, flipper length, bill length, bill width and bill depth).

Management and care of little penguins in captivity is well developed, both at places such as Napier's National Aquarium, and Massey University's Wildbase Hospital. Likewise, supplementary feeding of little penguin chicks with salmon smolt or similar is often undertaken in places such as 'Blue Penguins Pukekura' (Dunedin) when entire cohorts of chicks show signs of starvation.

The exact protocols and equipment for transferred eggs, chicks and adults, and supplementary feeding regimes, will be developed in consultation with John Cockrem, specialists from Wildbase Hospital/Wildbase Recovery, Department of Conservation, and other penguin specialists around New Zealand as necessary, based on the St Kilda protocols. It is recommended that the penguin ecologists who developed the St Kilda method are also consulted.

The list below is a preliminary list of key people. Further people are likely to be added to this list.

- Paul Rose, Napier Port Environmental Advisor. Paul has a permit that allows him to handle and salvage little penguins within the Port. He is required to shift penguins from working areas on the wharf where they might be accidentally harmed on a relatively regular basis. Paul visited the 'Oamaru Blue Penguin Colony' in December 2018, and met with colony scientist, Dr Philippa Agnew. He also visited 'Blue Penguins Pukekura', at Pilots Beach, Taiaroa Head, and Otago Peninsula, where he met with Dr Hiltrun Ratz. At both colonies, he discussed the Napier Port colony proposal with the scientists, and was able to inspect the two colonies in depth.
- Te Kaha Hawaikirangi, Napier Port Pou Tikanga - Infrastructure Environmental & Cultural Advisor. Upon the completion of appropriate training and certification and approvals, Te Kaha will work alongside Paul Rose and others in the recovery, capture and relocation of blue penguins.
- Professor John Cockrem, Massey University. John intends to apply to the Department of Conservation for a national little penguin permit to enable research work around the North and South Islands, including Napier Port. John will initially undertake all marking of little penguins with microchips, also known as passive integrated transponders or PITs. Once the permit is issued, Paul will be able to handle and mark birds under the authority of this permit, once fully trained by John.
- Joanna Sim (DabchickNZ) and her dog Rua will undertake the September 2019 survey, as previous years.

4.2.3 MANAGEMENT OF AFFECTED LITTLE PENGUINS DURING CONSTRUCTION

It is hoped that the temporary deconstruction of the revetment, removal of penguins, and reconstruction and covering, will mean that the final deconstruction of the revetment will entirely avoid the direct disturbance of penguins during the breeding season.

Nevertheless, the covered revetment should be thoroughly inspected several days prior to deconstruction commencing for signs of penguin use. Assuming the covered revetment is considered to have successfully excluded penguins from using it, it can be deconstructed as if no penguins were present. However, at the end of each day, the remaining revetment will need to be 'sealed', or recovered to prevent penguins from re-entering overnight (a camera trap could potentially be used to check for this possibility).

Rock and other stockpiles on the wharf will need to be checked daily for the presence of penguins before work can commence.

4.2.4 MONITORING AND RESEARCH

The development of the Port Nest Box Penguin Colony provides a valuable opportunity for little penguin research in Hawke's Bay and New Zealand in general. The colony has been designed so that the only access to and from the nest box colony is via a ramp, much wider at the base (in the sea) than at the top. This acts to funnel penguins through a relatively narrow gap where microchip readers and cameras can be installed to monitor all penguin movements. The restriction of penguins to nest boxes makes access to individual birds and nests straightforward for researchers. Nest success can be easily monitored, and marking of all fledglings can be undertaken each year. Nest boxes have also been shown to have higher nesting success than natural burrows in some locations, and birds will often choose nest boxes over natural nest sites.

Loudspeakers will be used to play little penguin calls to encourage new birds to take up residence, and transferred birds to stay. The colony is likely to increase slowly in size over time as more birds are attracted to the site, and birds that fledge from nest boxes return to establish their own burrows.

Multiple research avenues are possible at the proposed nest box colony. For example, studying annual productivity, dietary studies, foraging trip durations, chick provisioning, and foraging distributions during different parts of the breeding cycle would all be possible. In the long-term, estimates of juvenile and adult survival may be able to be determined.

In addition to the construction and landscaping of the nest box colony, Napier Port intends to:

- Support/undertake the long-term marking (with transponders) of chicks at the nest box colony.
- Support/undertake annual monitoring of nest success.
- Support the initial trialling of dataloggers to record details of adult foraging excursions.
- Support/undertake ongoing annual survey of the penguin population of the Port and surrounds.

4.3 ACHIEVING NO NET LOSS OF LITTLE PENGUINS

A condition of consent is to achieve no net loss of little penguins "in the vicinity of the Port" over a 10-year period following commencement of construction (Appendix 1). The vicinity of the Port is considered to be from the Port carpark on the western side to eastern beach, but does not include Hardinge Road (see Figure 2).

No net loss within 10 years will be achieved by:

- Minimising, and ideally avoiding, mortality during deconstruction, particularly adult mortality.
- Providing new nest sites (nest boxes) to offset the permanent loss of habitat resulting from revetment deconstruction.
- Maintaining the Port as predator-free habitat.
- Increasing survival by controlling cats and mustelids to low levels.

No net loss will be demonstrated by the maintaining the size of the local population of little penguin within the vicinity of the Port and surrounds 10 years after the start of construction. The 2018 survey indicated 75 penguin burrows within the vicinity of the Port. This will require regular monitoring of burrows at the Port using past survey methods. A key issue is that the external breakwater walls (northern and eastern) have not yet been surveyed for penguins, due to health and safety concerns. If the walls provide suitable penguin habitat, birds removed from the affected revetment may move into the external breakwater walls, and remain undetected in surveys, leading to a perceived decline in the Port penguin population (birds may also leave the vicinity of the Port entirely). Ideally, the external northern and eastern walls should be surveyed in 2019 if this can be safely achieved.

By the time deconstruction commences, a three-year baseline will have been obtained from the affected revetment, a two-year baseline from the remainder of the Northern Container Wharf, the Triangular Wharf, and Hardinge Road, and if it can be undertaken, a one-year baseline from the external breakwater walls. This will provide a reasonable baseline to compare future surveys in order to assess whether the loss of burrows from the affected revetment has been offset by increases elsewhere within the Port, including the Port nest box colony.

It is important to recognise that the Port little penguin population, as with any other population around New Zealand, will be significantly affected by climatic/marine influences. In years of poor food availability, chick and adult survival rates can be significantly affected. These influences are outside of the Port's control. No other regional population of little penguin is monitored for population trends, or breeding success, with which the Port could be compared. This may make it difficult to identify, for example, if a negative trend observed within the Port is occurring more widely.

Monitoring of breeding success (and other possible studies) of the Port penguin population may demonstrate factors limiting population growth, such as marine food sources, or possibly predation by terrestrial predators. Data obtained from tagged and monitored penguins may, in time, be able to be used to model predicted population trends within the Port. If no net loss has not been achieved at the end of 10 years, modelling may illustrate if this could be reasonably expected at a later date.

4.4 ALTERNATIVE OPTIONS FOR LITTLE PENGUIN MANAGEMENT

Consent conditions advise the consideration of alternative options for little penguin management outside of the Port environs in the event that no net loss cannot be achieved within the Port vicinity. Within Napier city, Port surveys indicate penguins are found along Hardinge Road, despite high public use, and anecdotal observations indicate burrows are likely to be present in all the seawalls around the Ahuriri Estuary. The greatest threat facing these penguins is likely to be dogs and humans. Dog control beyond its properties cannot be addressed by Napier Port.

Only two other significant penguin populations have been identified in the wider Hawke's Bay, at Cape Kidnappers and Motu-o-kura/Bare Island. However, penguins may be present along a much greater area of coastline. Surveys using a seabird conservation dog, particularly adjacent to Motu-o-kura on the mainland, and around the wider Cape Kidnappers area, may identify populations that could benefit from the provision of nest boxes (particularly where nesting habitats may be limiting), and from terrestrial predator control. These possibilities should be investigated with local community and iwi involvement if ongoing monitoring within the Port indicates no net loss may not be achieved.

5. OTHER BIRD SPECIES

5.1 SHAGS

5.1.1 SPECIES, STATUS AND THREATS

Five species of shags may potentially use the revetments around Napier Port for roosting, and possibly nesting:

- Black shag, kawau (*Phalacrocorax carbo*; At Risk-Naturally Uncommon)
- Spotted shag, pārekareka (*Stictocorbo punctatus*; Not Threatened) Pied shag, kāruhiruhi (*P. varius*; At Risk-Recovering)
- Little black shag, kawau tūi (*P. sulcirostris*; At Risk-Naturally Uncommon)
- Little shag, kawaupaka (*P. melanoleucos*; Not Threatened).

None of the shag species are considered to be in decline. However, the pied shag has only recently been listed as 'Recovering', and was previously listed as Nationally Vulnerable. Populations in northern North Island may still be in decline. Threats to this species are not well understood.

Shags using the revetments and breakwater will be accustomed to wharf activities, including the movement of vessels in and out of the Port. It is likely that shags have many alternative roosting sites around wider Napier and the Hawkes Bay. Nesting locations appear to be poorly known.

5.1.2 SURVEY, MONITORING AND MANAGEMENT

Roosting shags may be disturbed by construction noise, particularly pile-driving. However, while human disturbance is known to affect shag/cormorant roosts, the effect of noise alone on shag species is not well understood. It is possible that the noise of pile-driving may stop shags from roosting on the main breakwater, at least for periods when pile-driving is underway. If this occurs, shags will roost elsewhere.

The use of camera traps will be trialled on the affected revetment and on the breakwater spit to monitor use of the revetments by different species of shags. The cameras could, for example, be set to take automatic pictures every hour for specified periods. The objective will be to describe the daily and seasonal variation in use of the revetments by different species of shag before construction, during construction, and after construction. The trial is needed to test camera locations (whether photographs can be taken that can enable monitoring of a length of revetment and allow species identification), and to check that sufficient data can be obtained to allow for statistical analysis. It is expected that shags will use the breakwater spit after the completion of the wharf at similar levels to the present day. Consultation with relevant specialists will be undertaken if this does not occur as expected.

The preliminary concept design for the little penguin nest box colony allows for the development of shag roosts to partially offset the loss of potential roosts at the affected revetment. However, it is as yet unclear whether the revetments closest to wharf activities are used regularly, compared to the breakwater spit. This will be investigated as part of the above monitoring to assess the value of roost development.

5.2 BLACK-BILLED GULL, RED-BILLED GULL, WHITE-FRONTED TERN

5.2.1 HABITATS AND THREATS

Three other bird species of conservation interest breed at the Port on occasion. Black-billed gull/tarāpunga (Threatened-Nationally Critical) nested at the northeast end of Geddis Wharf (No. 3) in Napier Port in 2015-16, near the breakwater in early 2019, and was recorded nesting at the Port in 1995 during the national black-billed gull survey. Very small numbers of red-billed gull/tarāpunga (At Risk-Declining) were nesting in the black-billed gull colony in 2015-16. White-fronted tern/tara (At Risk-Declining) have also nested at various locations at the Port, most recently in 2015-16 and 2018-19.

All three species are threatened by the impacts of introduced predators at locations where they breed. Marine-based factors appear to have caused rapid declines of red-billed gulls at predator-free offshore islands, and marine food shortages may affect all three species to some degree.

Black-billed gulls and white-fronted terns are highly mobile species, capable of shifting colony sites from year to year. Their appearance at the Port is unpredictable. Other regularly-used colony sites include the braided rivers of the Hawkes Bay (such as the Tukituki and the Ngaruroro rivers), and their associated beaches and gravel bars. It is likely that the Port provides an attractive breeding location, relatively free of the disturbances that predominate at these more 'natural' sites, such as dogs, people, other terrestrial predators, four-wheel drive vehicles and other vehicles, which together can destroy nesting attempts and cause colony abandonment.

The species' use of colony sites located within metres of Port activities suggests that the gulls and terns are largely tolerant of these types of disturbances, which are relatively predictable, and do not intrude on the colony site itself.

5.2.2 SURVEY, MONITORING AND MANAGEMENT

It is not known whether black-billed gulls, red-billed gulls, and white-fronted terns will tolerate the increased noise associated with construction of the wharf, particularly during pile-driving. Pile-driving is proposed to start well before the 2020 breeding season, continuing for just over a year, and finishing before the 2021 breeding season. If this remains the case, it is unlikely that an established colony will be disturbed.

The development of the Port little penguin nest box colony may provide attractive habitat for all three species, particularly if some areas remain unvegetated concrete or stone. Actively providing areas for nesting colonies needs to be balanced with the potential for negative interactions between birds, particularly black-billed gulls, and Port workers. Black-billed gulls attacking workers has been documented by Department of Conservation staff at Tokaanu Dam, near Turangi. Unpleasant and potentially hazardous for workers, it also suggests that the gull colony is experiencing a level of disturbance from day-to-day activities. This can be managed if required by increasing vegetation cover at the nest box colony which will reduce the available nesting area. The proposed design of the nest box colony includes a high fence between the colony and the active wharf area, which may also reduce the potential for such interactions.

The establishment and breeding success of black-billed gull, red-billed gull, and white-fronted tern colonies is a matter of conservation interest. The routine control of rodents and increased control of mustelids and cats is likely to provide Port colonies with a much higher quality nesting environment than is available at the majority of other locations around the North Island. Port staff should record the establishment of colonies at the Port, and seek advice on monitoring the success of the colony from the Department of Conservation, or other specialists as required. Colony information should be entered into eBird, and/or provided to local Department of Conservation staff.

ACKNOWLEDGMENTS

Paul Rose, Napier Port Environmental Advisor, and Professor John Cockrem, Massey University.

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6. APPENDIX 1

CL180008C - CONSENT CONDITIONS - BIRDS

Little Blue Penguin (and other species) – Avian Management Plan (AMP)

25. In association with the Department of Conservation and mana whenua hapū, the consent holder shall prepare an Avian Management Plan. The purpose of the plan shall be to as far as practicable avoid, but otherwise mitigate or remedy, adverse effects on the populations of Little Blue Penguin and other species established in and nearby the existing revetment, during the construction period. The Avian Management Plan shall address the following:
- Measures to minimise adverse effects on bird populations (specifically the Little Blue Penguin) during construction,
 - Required training of Port of Napier Staff and/or Contractors,
 - Any additional steps that are necessary to achieve no net loss of the Little Blue Penguin population in the vicinity of the Port over a 10-year period following commencement of construction.
 - Any additional steps that are necessary to mitigate effects on White-Fronted Terns, Shag species and any other avian species considered necessary (as advised by a suitably qualified person) in the vicinity of the Port over a 10-year period following commencement of construction.
 - If required, management of the Little Blue Penguin population within the wider Hawke Bay area (for example, pest control, provision of nest boxes).

Advice Notes (relating to AMP):

Expert advice from a suitably qualified person shall be sought in developing the AMP. Environmental enhancements could include public education and signage to protect the Little Blue Penguin habitat/population near the Port.

In achieving (c), where suitable Little Blue Penguin habitats cannot be achieved in the immediate vicinity of the Port, opportunities in the wider Hawke Bay area should be considered.

26. The consent holder shall submit the AMP to the Council for certification at least three months prior to any works commencing.

The Council may seek external advice from a suitably qualified individual prior to certification of this plan. The consent holder would be invoiced for any costs (actual and reasonable) associated with this advice.

Any changes to the plan in future shall be discussed in advance with the Council and the change is to be submitted and certified prior to any activity associated with the change commencing.

7. APPENDIX 2

CONCEPT DESIGN FOR PORT NEST BOX COLONY

1

Concept design for kororā colony at Napier Port

Version 1

9 November 2018

John Cockrem
Massey University

A concept design based on my experience with planning new kororā colonies is presented here. The kororā colony will be located beside the northern and western revetment walls on the northwest corner of the Port. Figure 1 shows an outline of the site at Napier Port. The Figure shows the proposed location for a ramp where penguins can come ashore, an entrance area, a proposed sand area to provide nesting habitat for terns, gulls and other birds, and some proposed posts for roosting and breeding shags.

Landscaping to create penguin habitat

The Oamaru Blue Penguin Colony has earth mounds and small trees, with most of the ground being mown grass. The Napier Port colony could be based on the Oamaru colony. The new colony will be relatively narrow. The ground could be landscaped as shown in Figure 2, with earth mounds and the ground surface predominantly sown in grass. It will be important to plant small fast growing trees and large bushes that will provide shade for nestboxes. Trees or bushes should grow to become 2 to 3 metres high with a canopy that is open underneath to provide shade together with open ground underneath so penguins can easily move around. Ngaio is one potential coastal plant that provides these conditions. The trees can be provided with their own watering systems so they grow during the summer.

Ramp

A ramp will be built so penguins can readily come ashore and depart from the colony. It is suggested that the ramp be on the west side of the colony as this would be more sheltered than the north side. The ramp can be placed near the north-west corner of the colony. The ramp will provide a single landing and departure site where birds can be watched and a transponder reader can be installed so the arrival and departure times of individual birds can be recorded. Figure 3 shows drawings of the ramp. The ramp will extend down into the water below MLWS, and can have a resting area just above MHWS and a steeper slope above this resting area than below the area. The edges of the ramp will be fenced so that penguins come up the ramp and onto the colony rather than moving off into the rocks of the revetment wall. It might be possible to have a transponder reader in the ground so that penguins step over the reader when they get to the top of the ramp and into the colony. Alternatively, once birds are accustomed to using the ramp then a fence can be installed across the top of the ramp with an entrance through which the penguins will pass to get to the colony. There would be a transponder reader at the entrance, following the example of the Oamaru Blue Penguin Colony.

2



Figure 1. Kororā colony area version 1.

3

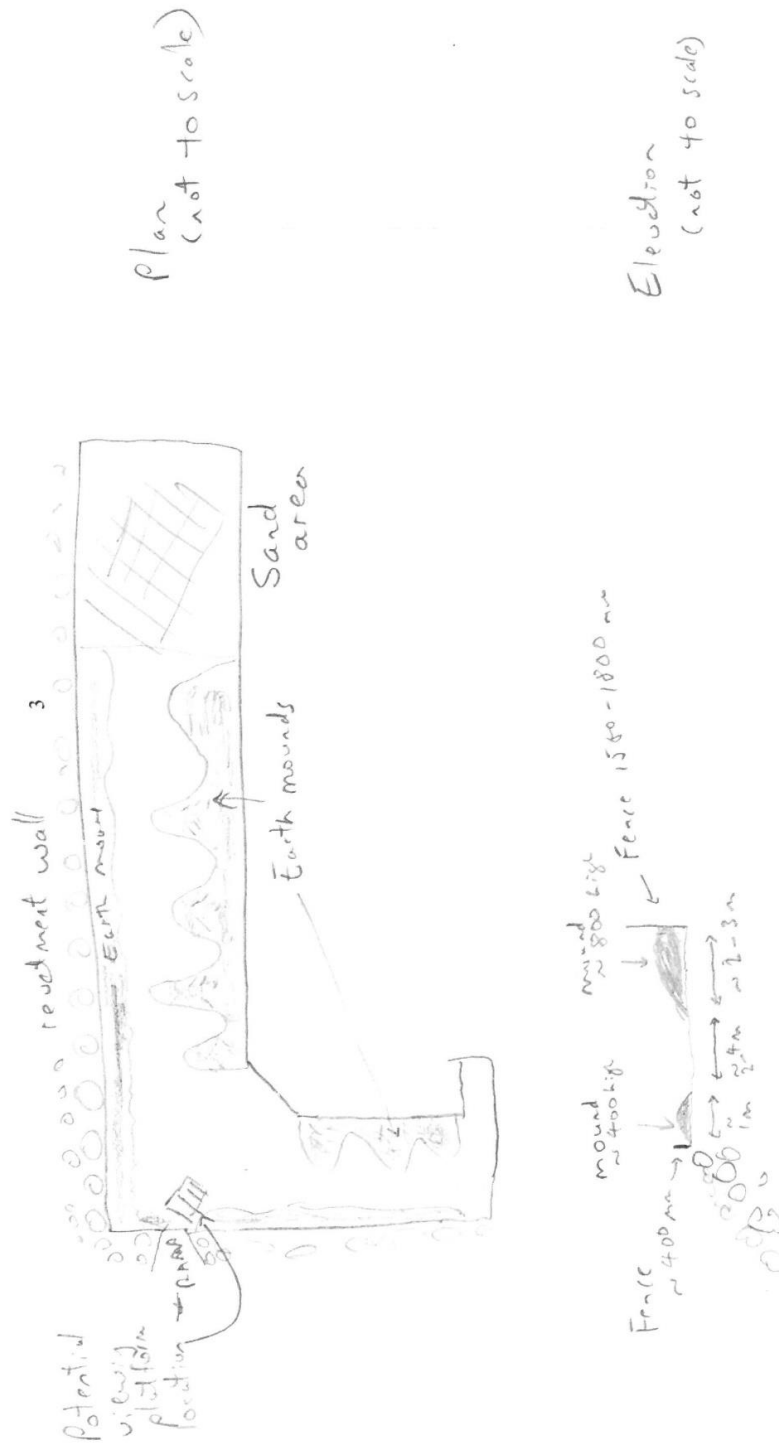


Figure 2. Landscaping to create penguin habitat.

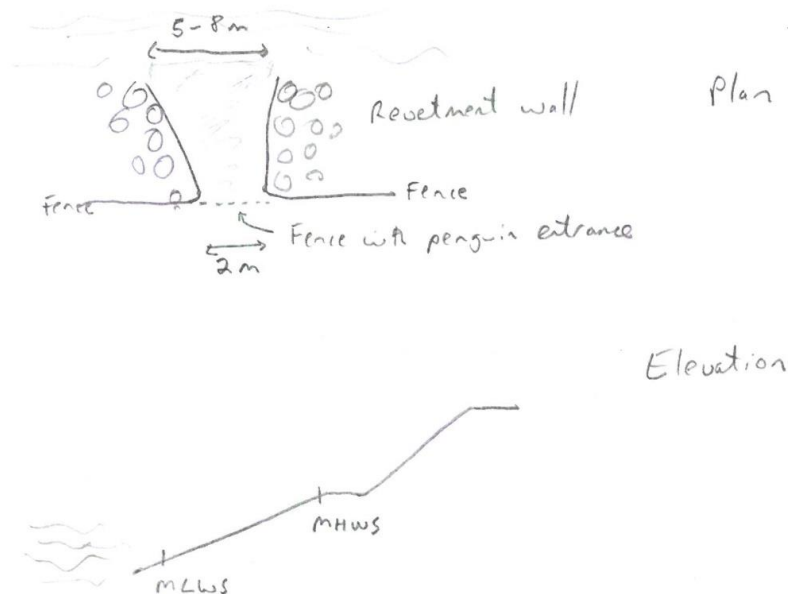


Figure 3. Ramp for penguins.

Fence between colony area and revetment wall

A low wooden fence, say 400 mm high, could be built along the edge of the revetment wall. This fence would be contiguous with the fence at the side of the ramp. It will ensure that once penguins come up the ramp into the colony they remain within the colony rather than moving into the revetment wall where they could not be found.

Fence on land side of the colony

A wooden fence, say 1500 to 1800 mm high, could be built along the edge of the colony to provide a secure barrier between the colony and the adjacent land. The fence would have gateways for vehicle access at the north-west corner of the colony. There might also be gates halfway along the West side of the colony and halfway along the north side of the colony. There would also be a gate approximately 40 m west from the north east end of the colony. This gate would provide vehicle access to the proposed sand area.

Entrance area

The 30 m long southern part of the colony could be left open rather than being landscaped as penguin habitat, initially at least, so that a temporary building or shed could be placed here for gear for the maintenance of the penguin colony and as a base for the penguin studies. If there was controlled public access to the colony in future this is where the public would enter the colony.

Nestboxes and electronics

Nest boxes will be placed in the landscaped penguin habitat. An important aspect of the establishment of the colony will be to use loudspeakers to play kororā calls to attract birds to come up the ramp and to come into the colony. Transponder readers, motion detectors and cameras can be installed to provide data for penguin studies and to provide video of movements and activities of birds at night.

Sand area

It is suggested that an area of sand be created at the north east corner of the kororā colony. A sand area with broad sand mounds maybe 300 to 400 mm high would create a habitat for nesting white-fronted terns and red billed gulls, and potentially for variable oystercatchers and banded dotterels. It is suggested that this area could be 30 to 40 m long.

Posts with roosting and breeding platforms for shags

Posts with horizontal arms for perching and with platforms for nesting could be installed along the edge of the revetment wall in the south-west corner of the colony. These would provide roosting and potential breeding habitat for several species of shags.

Future raised walkway

If public access were to be available once the colony is established this should only be for people to come into the colony under supervision. A raised walkway could be built from the entrance of the colony to a viewing platform at the penguin ramp so that people could walk to the ramp whilst birds could still move underneath the walkway. The walkway would ensure that people did not walk around on the ground.

Future viewing platform at ramp

A viewing platform could be built so that people could watch birds coming ashore at the ramp.

Future penguin nest viewing shed

The Oamaru Blue Penguin Colony has a small building with a raised floor with penguin nest boxes underneath the floor. People can come into the building, with a guide, and looked down through glass at birds in the nest boxes. Once the colony was well established then a penguin nest viewing shed could be built.

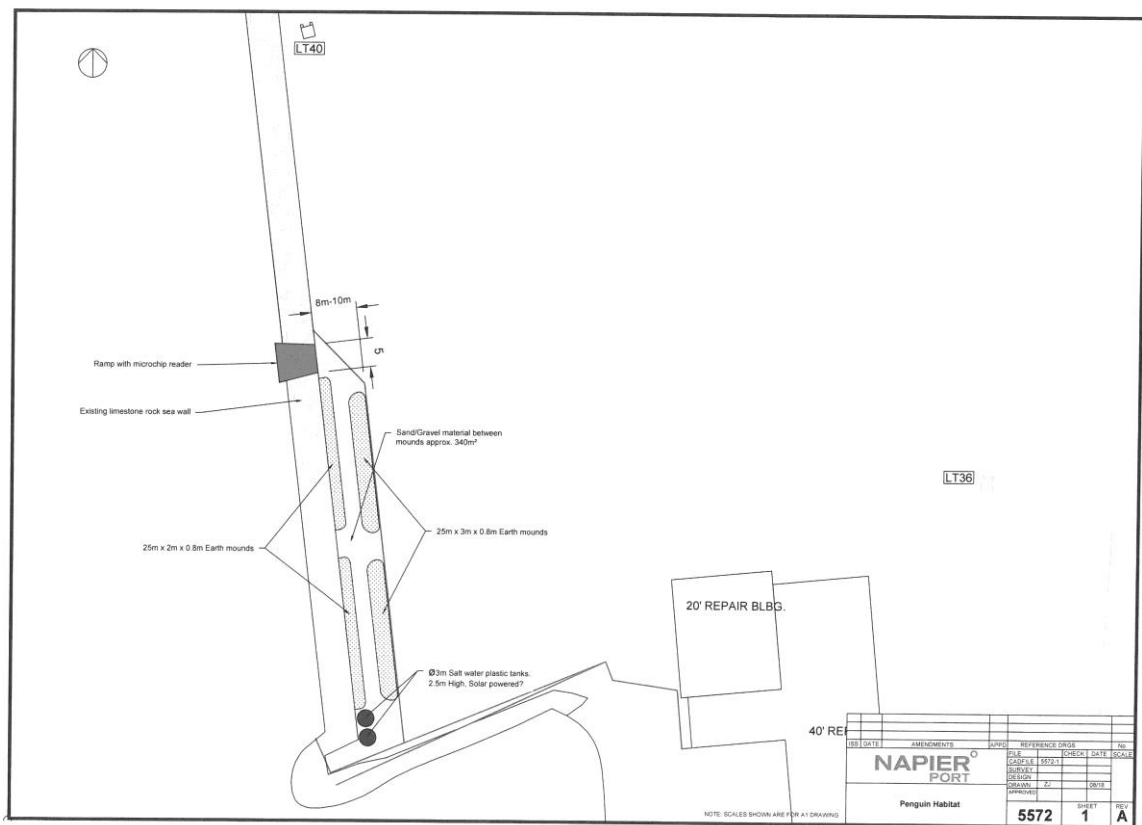
Kororā colony development suggestions version 1

1. Confirmation of width of kororā area from edge of revetment wall to edge of kororā area
2. Confirmation of concept plan
3. Bring in fill to raise ground level to final level.
4. Lay reticulated power cables (for lights, speakers and nestbox electronics) and water pipes in ground (for grass and plants)
5. Construct ramp from sea and install fence along edges of ramp. Place temporary barrier across the top of the ramp to stop penguins from coming into the colony whilst it is under construction.
6. Build low fence along edge of revetment piles of rocks
7. Bring in soil and dump in piles along the colony
8. Bring in sand for nesting area for terns, gulls, oystercatchers and dotterels
8. Build fence on land side of the colony (with vehicle gateways).
9. Spread soil to form mounds and backfill to fences. Sow grass seed.
10. Spread sand for nesting area
11. Planting, with watering system for each plant
12. Install speakers for kororā calls and install cameras e.g. at ramp
13. Place nestboxes
14. Possibly install shade cloth over some nestboxes
15. Open the top of the ramp so kororā can come into the colony, start playing kororā calls

 Once kororā are using nestboxes in the new colony the process of removing the revetment wall at the new wharf site without risk to birds in the wall could begin.

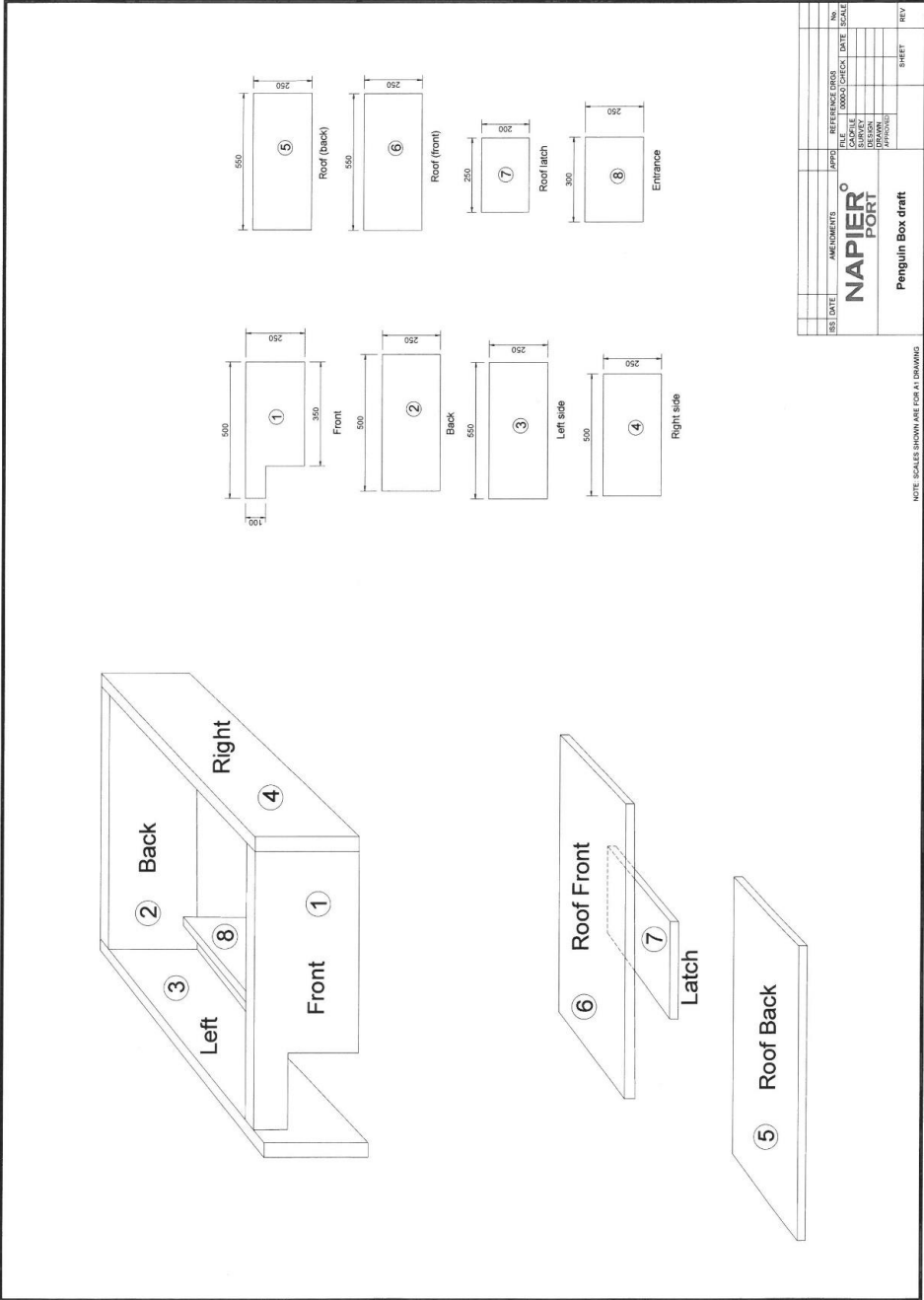
8. APPENDIX 3

NAPIER PORT NEST BOX COLONY (FEB 2019)



9. APPENDIX 4

NEST BOX DESIGN



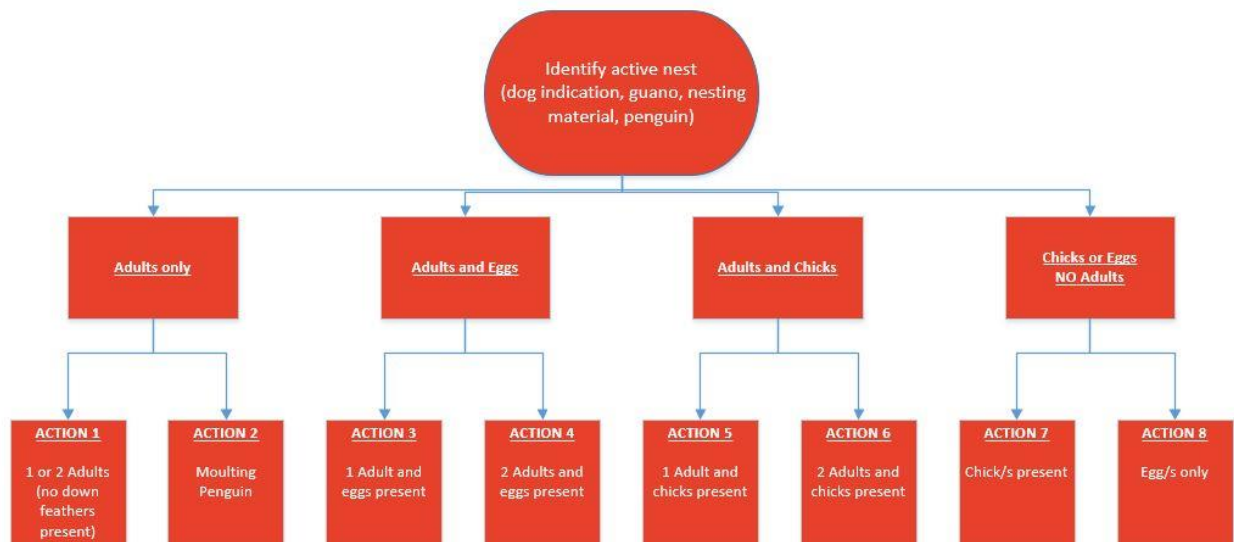


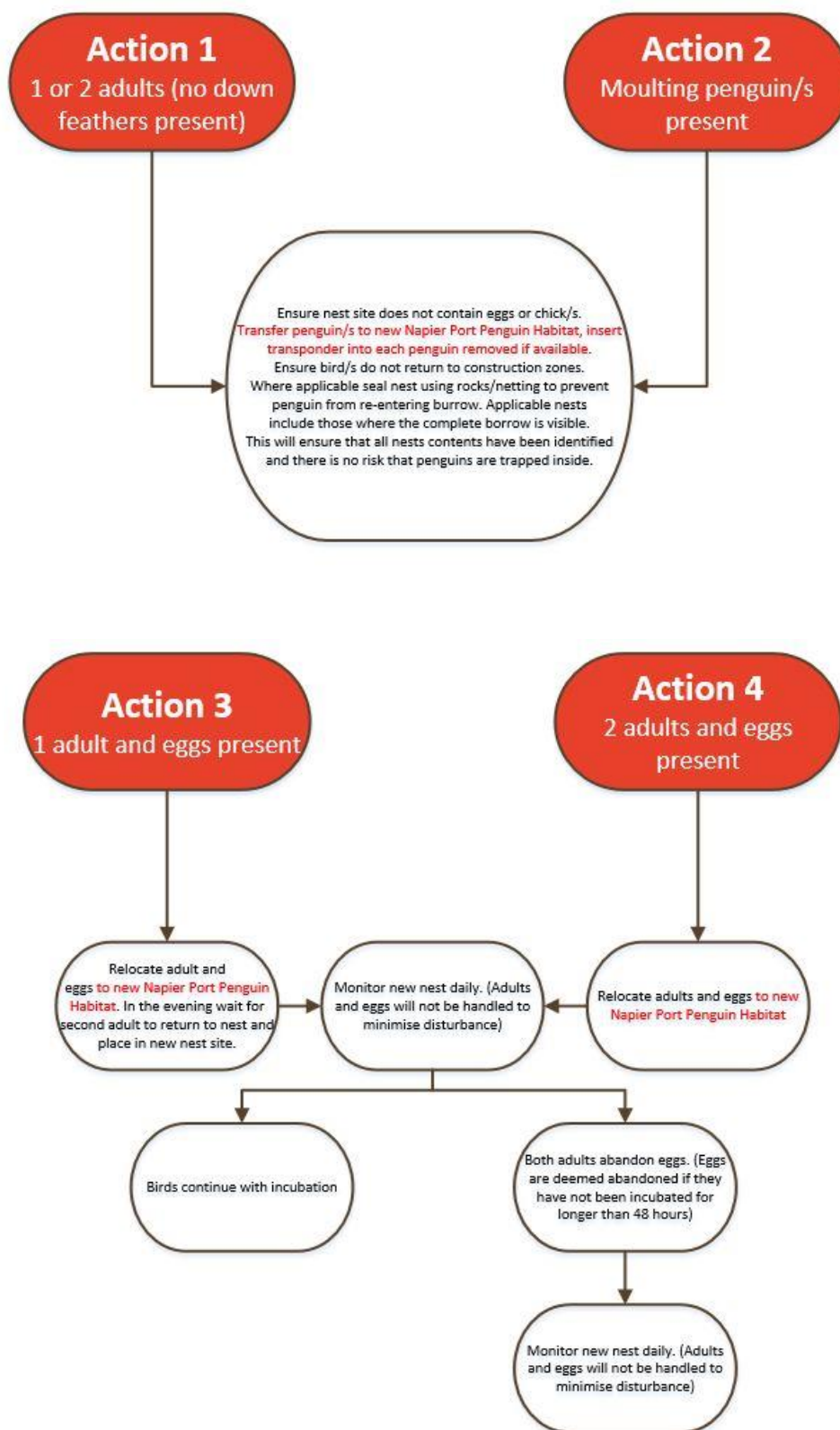
10. APPENDIX 5

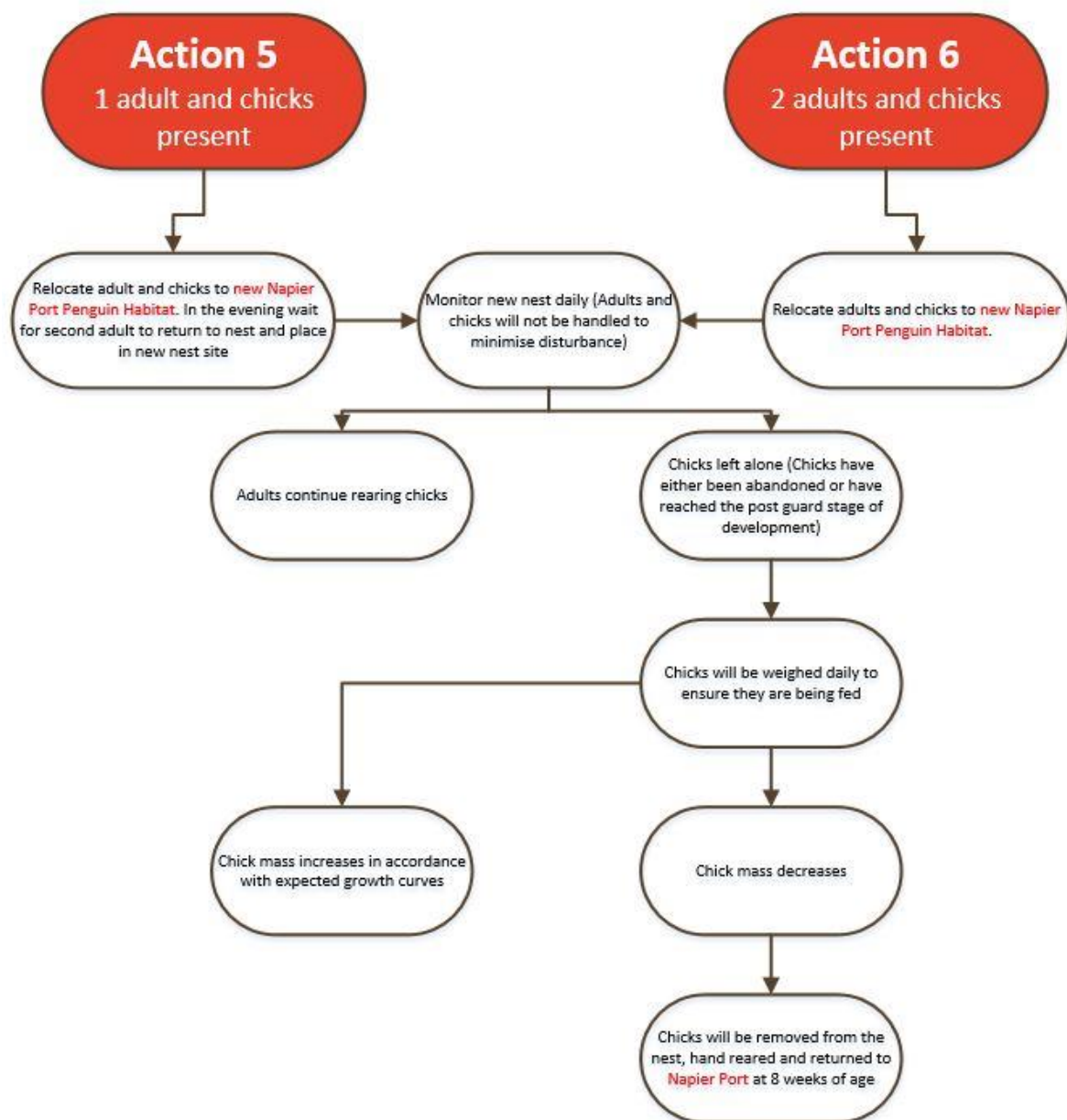
NAPIER PORT ACTION PLAN

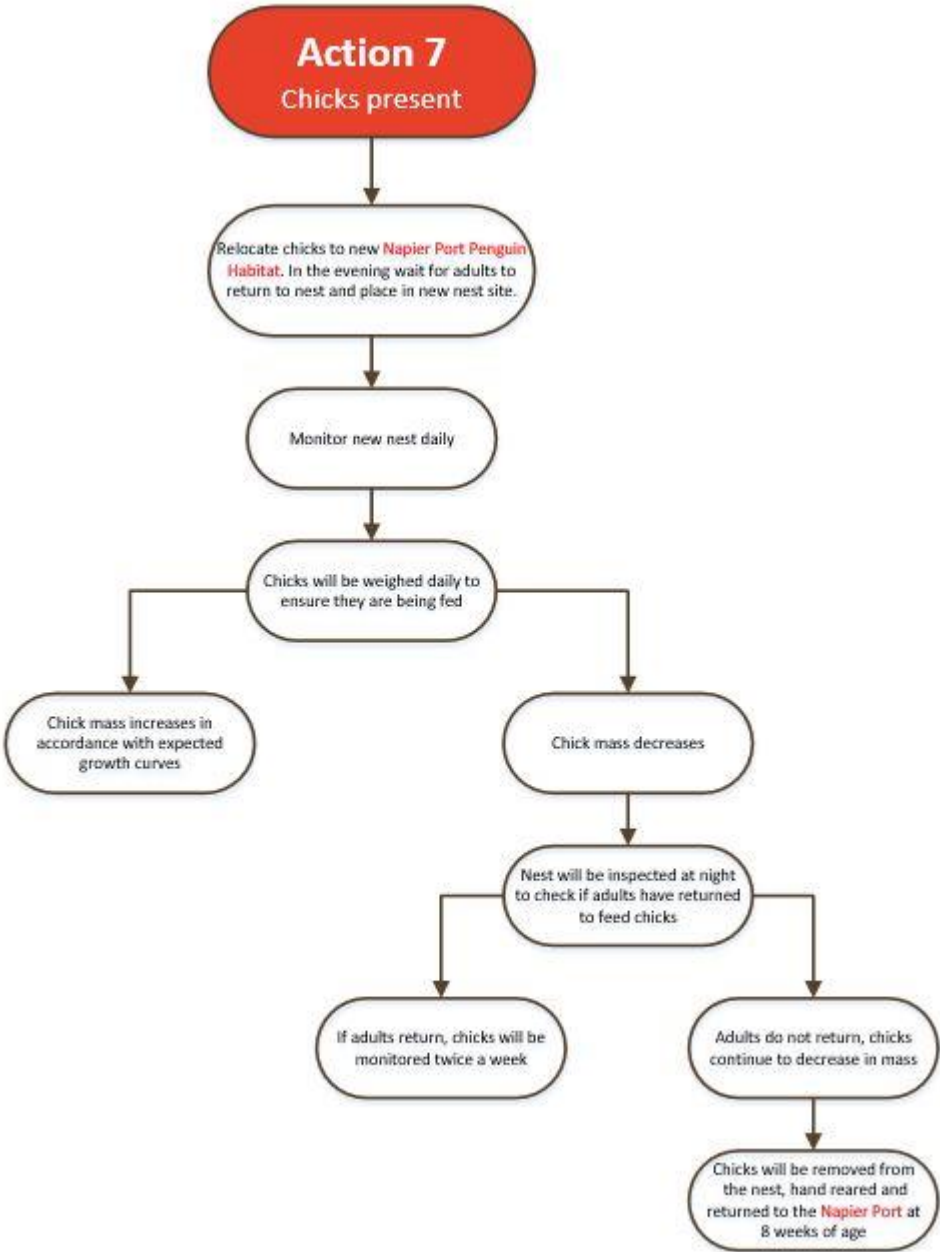
The Napier Port Action Plan is taken directly from Kowalczyk *et al.* (2013). Text in RED has been changed from the original flow charts top align with proposed Napier Port management. It is envisaged that this will be adapted to the situation at Napier Port, and expanded to become a guiding document for all on-site penguin management at Napier Port before and during construction.

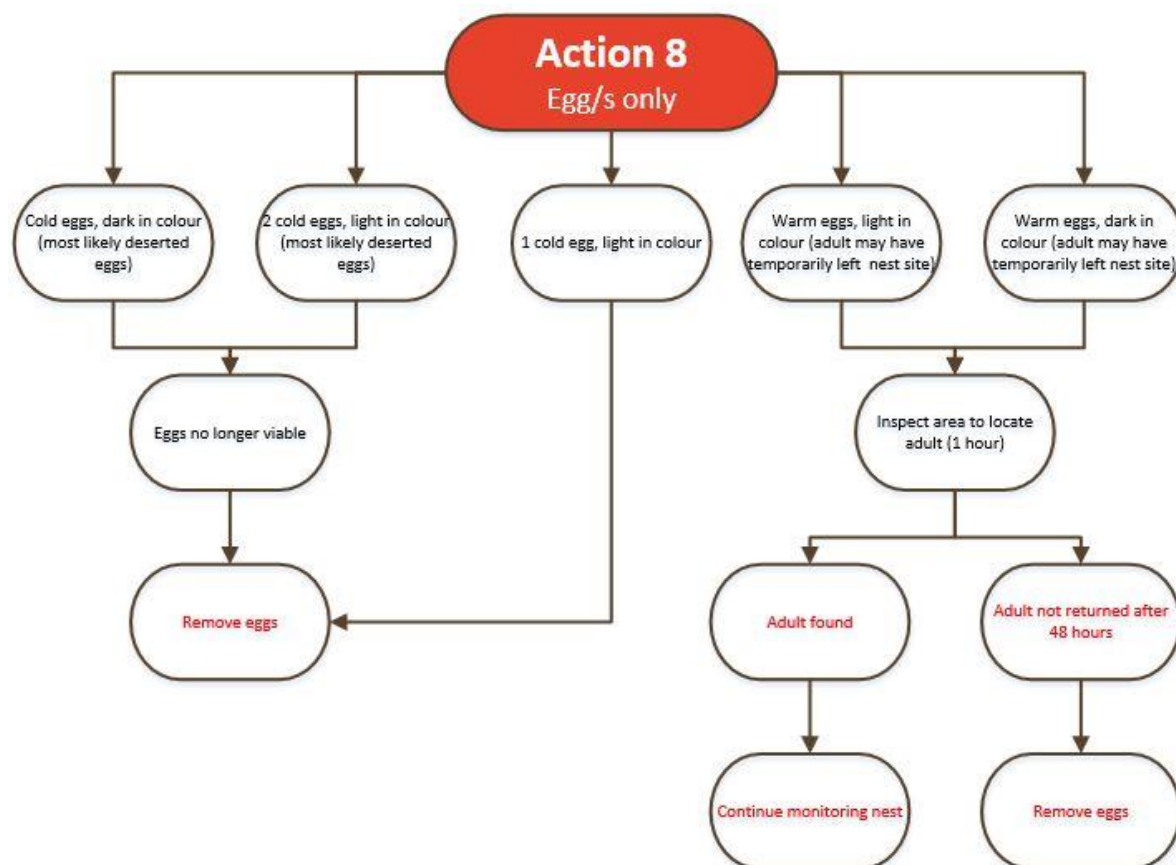
The Action Plan was devised by EcoCentre, Earthcare, and the Department of Environment and Primary Industries to assist in the management of penguins in construction zones. The plan provided directions as to how to deal with little penguins at various stages of the annual cycle including the non-breeding and breeding periods.











11. APPENDIX 6

WILDLIFE ACT AUTHORITY APPLICATION