State and trends in the indigenous bird values of the Pōneke / Wellington City coastline

May 2025

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This report was prepared for Greater Wellington Regional Council in fulfilment of the Contract for Services dated 24th November 2023

26th May 2025

Citation:

This report should be cited as:

McArthur, N. 2025. State and trends in the indigenous bird values of the Pōneke / Wellington City coastline. Client report prepared for Greater Wellington Regional Council, Wellington.

Cover Image: Tara / white-fronted terns (*Sterna striata*), tarāpunga / red-billed gulls (*Chroicocephalus novaehollandiae*) and a tōrea pango / variable oystercatcher (*Haematopus unicolor*) take flight from a rock stack in Oriental Bay on the 25th of December 2020. Image credit: Finn Davey / Macaulay Library at the Cornell Lab of Ornithology (ML290833461).

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Executive Summary

Wellington City Council (WCC) and Greater Wellington Regional Council (GWRC) share a statutory responsibility under the Resource Management Act (1991) to maintain the indigenous bird values of the Pōneke / Wellington City coastline. To discharge these responsibilities effectively, both WCC and GWRC need to maintain a detailed and up-to-date understanding of the indigenous bird values of the Pōneke / Wellington City coastline. To achieve this, WCC and GWRC have collaborated to carry out an annual bird survey along the Pōneke / Wellington City coastline between Oteranga Bay and the western end of Petone Beach each year since 2018.

Fifty-one bird species have been detected during the seven annual surveys carried out since 2018, including 37 species (73%) which are native or endemic to New Zealand. Twenty of these 51 bird species (39%) are ranked as Nationally Threatened or At Risk under the New Zealand Classification System, and 17 species (33%) are ranked as Regionally Threatened.

Four stretches of the Pōneke / Wellington City coastline play a particularly important role in maintaining indigenous coastal bird values within the city. The Oruaiti Reserve foreshore on Te Motu Kairangi / Miramar Peninsula supports regionally significant nesting colonies of kawau tikitiki / spotted shags, tarāpunga / red-billed gulls and tara / white-fronted terns. Taputeranga Island in Island Bay is one of only four breeding sites for matuku moana / reef heron in the Wellington region and provides nesting habitat for tarāpunga / red-billed gulls and tōrea pango / variable oystercatchers. The Wellington south coast between Oteranga Bay and Te Rimurapa / Sinclair Head provides habitat for most of the pohowera / banded dotterels and pīhoihoi / New Zealand pipits found along the Pōneke / Wellington City coastline. The southern end of the Wellington airport runway supports the only breeding population of pohowera / banded dotterels found along the Pōneke / Wellington City coastline east of Te Rimurapa / Sinclair Head.

This report provides an assessment of the habitat value of 67 built structures in the Pōneke / Wellington City coastal marine area for indigenous coastal birds. Structures situated in the inner harbour and those that are inaccessible to the general public appear to provide the highest-value habitat for roosting birds.

To maintain the diversity and abundance of indigenous coastal birds along the Pōneke / Wellington City coastline it is recommended that WCC and GWRC focus on reducing levels of human disturbance at high-value coastal habitats and work with resource consent applicants to ensure that the removal of derelict coastal structures results in no net loss in high-quality roosting habitat.

Fifty-eight percent of the Nationally Threatened and At Risk bird species detected during this survey are considered at risk from the impacts of human-induced climate change. With sea levels along the Pōneke / Wellington City coastline projected to rise by up to 1 metre over the next century, there is an urgent need for both WCC and GWRC to include consideration of climate change impacts on indigenous coastal bird species into all aspects of the future management of the Pōneke / Wellington City coastline and its bird values.

Keywords: Citizen science, coastal bird, eBird, Greater Wellington Regional Council, iNaturalist, Pōneke, Proposed Natural Resources Plan, Wellington City, Wellington City Council

1. Introduction

Wellington City Council (WCC) and Greater Wellington Regional Council (GWRC) share a statutory responsibility under the Resource Management Act (1991) to sustainably manage coastal environments in Pōneke / Wellington City, including maintaining the indigenous bird values of the city's coastline.

Wellington City Council has prepared a biodiversity strategy and action plan called *Our Natural Capital* which outlines the council's vision, goals, objectives and priorities for maintaining and enhancing Pōneke / Wellington City's indigenous biodiversity. Objective 1.2.1 of *Our Natural Capital* commits WCC to working "with partners, including the Department of Conservation, community groups and others, to ensure that no nationally or regionally threatened or locally significant species is lost to Wellington, and ensure that genetic diversity is retained as far as possible." To achieve this, action 1.2.1a of *Our Natural Capital* commits WCC to "work with partners to locate and map all nationally or regionally threatened and locally significant species" present within Pōneke / Wellington City (WCC 2015).

Under the Resource Management Act (1991), Greater Wellington Regional Council is required to prepare a Regional Coastal Plan that gives effect to the New Zealand Coastal Policy Statement (NZCPS) (DOC 2010). The purpose of this plan is to assist in achieving the sustainable management of the Wellington region's coastal environment, by outlining objectives, policies and rules that govern which activities GWRC will allow, control or prohibit in the coastal environment. As in a number of other regions, GWRC's Coastal Plan isn't a stand-alone document. Rather, it has been incorporated into a Proposed Natural Resources Plan for the Wellington region, a single document outlining how all of the Wellington region's natural resources will be managed under the Resource Management Act (GWRC 2015).

Section 6(c) of the Resource Management Act (1991) provides a mechanism that contributes to the sustainable management of coastal sites with high natural values, by directing Wellington's Proposed Natural Resources Plan to "identify ecosystems and habitats with significant biodiversity values". Policy 23 of the Wellington Regional Policy Statement contains a set of criteria to be used to identify these significant ecosystems and habitats, which in turn has been translated by McArthur *et al.* (2015) to be applied to data describing the indigenous bird values of coastal sites in the Wellington region. Desktop reviews of existing data describing the indigenous bird values of the Wellington coastline carried out in 2013 and 2015 identified a total of 51 coastal sites that meet these Policy 23 translation criteria and these have been listed in Schedule F2(c) of Wellington's Proposed Natural Resources Plan (McArthur & Lawson 2013; McArthur *et al.* 2015; GWRC 2015). A subsequent review of bird occurrence data collected between 2015 and 2020 identified a further 31 sites that have been recommended for inclusion in a future revision of Schedule F2(c) of the Proposed Natural Resources Plan (McArthur 2020b).

To continue to discharge these statutory responsibilities as efficiently and effectively as possible, both WCC and GWRC need to maintain a detailed and up-to-date understanding of the indigenous bird values of the Pōneke / Wellington City coastline and the spatial distribution of those values. Existing knowledge of the distribution of indigenous bird values along the city's coastline is variable, however. For example, the bird values of Te Whanganui-a-Tara / Wellington Harbour are comparatively well known, largely due to a long-running Birds New Zealand project to monitor trends in the abundance and distribution of birds around the harbour's coastline. This project has been running since 1975 and

consists of four two-year sets of monthly bird surveys carried out along the Te Whanganui-a-Tara / Wellington Harbour coastline between Owhiro Bay and Te Rae Akiaki / Pencarrow Head, during 1975-1977, 1986-1988, 2008-2010 and 2018-2020 (Robertson 1992; Birds New Zealand unpublished data). These counts have demonstrated that the Te Whanganui-a-Tara / Wellington Harbour coastline supports a high diversity of indigenous bird species, including a significant number of species ranked as both Regionally and Nationally Threatened or At Risk under the New Zealand Threat Classification System (Robertson 1992; Robertson *et al.* 2021; Crisp *et al.* 2024). These surveys have documented substantial seasonal fluctuations in the abundance of a number of bird species including kawaupaka / little shags (*Microcarbo melanoleucos*), tarāpunga / red-billed gulls (*Chroicocephalus novaehollandiae*) and tara / white-fronted terns (*Sterna striata*) as well as long-term changes in the abundance of pāngurunguru / northern giant petrels (*Macronectes halli*) and karoro / black-backed gulls (*Larus dominicanus*), the latter of which are likely due to reductions in discharges from abattoirs and sewer outfalls within the harbour (Robertson 1992).

In contrast, knowledge of the indigenous bird values of the Wellington south coast to the west of Owhiro Bay is fairly sparse due to a lack of recent survey effort, which in turn is likely due to the relative inaccessibility of this stretch of the Pōneke / Wellington City coastline. To fill this gap, and to map the indigenous bird values of Te Whanganui-a-Tara / Wellington Harbour at a greater level of spatial resolution, Greater Wellington Regional Council and Wellington City Council have been collaborating since 2018 to conduct annual bird surveys along selected sections of the Pōneke / Wellington City coastline. Between 2017 and 2018, Greater Wellington Regional Council undertook a survey to map coastal indigenous bird values to a 1 km resolution along the entire 460 km of the Wellington region coastline, including the entire Pōneke / Wellington City coastline. The results of these surveys are summarised in McArthur *et al.* (2019). From 2019 onwards this survey was repeated each year along the Pōneke / Wellington City coastline between the western end of Petone Beach and Oteranga Bay and the results of these surveys are summarised in Burgin & Ray (2020), McArthur *et al.* (2021a), McArthur (2022), McArthur (2023) and McArthur (2024).

These surveys have recorded the presence of 51 bird species along the Pōneke / Wellington City coastline between Petone Beach and Oteranga Bay, including 37 species (73%) which are native or endemic to New Zealand, 20 of which (54%) are ranked as Nationally Threatened or At Risk under the New Zealand Classification System, and 17 of which (46%) are ranked as Regionally Threatened or At Risk. These surveys have also shown that four stretches of the Pōneke / Wellington City coastline play a particularly significant role in maintaining indigenous coastal bird values within the city. The Oruaiti Reserve foreshore on Te Motu Kairangi / Miramar Peninsula supports the only nesting colonies of kawau tikitiki / spotted shags (*Phalacrocorax punctatus*), tarāpunga / red-billed gulls and tara / white-fronted terns to be found on the mainland Pōneke / Wellington City coastline. Taputeranga Island in Island Bay is one of only four known breeding sites for matuku moana / reef herons (*Egretta sacra*) in the Wellington region and supports an estimated 20% of the regional breeding population of this Regionally Critical species. The Wellington south coast between Oteranga Bay and Sinclair Head provides habitat for the majority of pohowera / banded dotterels (*Anarhynchus bicinctus*) that breed in Pōneke / Wellington City and supports most of the pīhoihoi / New Zealand pipits (*Anthus novaeseelandiae*) to be found along the Pōneke / Wellington City coastline. The foreshore at the southern end of the Wellington airport runway supports the only breeding population of pohowera / banded dotterels to be found along the Pōneke / Wellington City coastline east of Sinclair Head.

This report summarises the results of a seventh year of surveys carried out along the Pōneke / Wellington City coastline during the summer of 2024-2025, incorporating results from the surveys carried out during the preceding six years. This report also provides an updated assessment of the

habitat value of built structures situated along the Pōneke / Wellington City foreshore for coastal birds, by combining bird occurrence data collected during this survey with citizen science data sourced from the New Zealand eBird and iNaturalist databases.

2. Methods

2.1 Coastline surveys

An annual bird survey has been carried out along 55 km of the Pōneke / Wellington City coastline, between the western end of Petone Beach and the western end of Oteranga Bay, each year between 2018 and 2024 (Figure 2.1). The majority of the mainland coastline was traversed on foot, except for a 5 km stretch of coast between the western end of Petone Beach and Ngauranga Gorge, which was surveyed from a south-bound commuter train due to the difficulty of accessing this stretch of coast on foot. During successive surveys, Taputeranga Island was either visited by kayak or surveyed from the adjacent mainland coastline using a 20-60x magnification spotting scope.

Surveys were carried out between November and January each year, at a time of year when most coastal-breeding shorebirds were breeding and were therefore more sedentary, occupying established breeding territories and 'anchored' to active nests or broods of chicks. Carrying out these surveys at a time of year during which these species are relatively sedentary minimises the risk of double-counting birds that would be more likely to disperse over larger distances along the coastline in other seasons. For example, although a number of the shorebird species present along the Pōneke / Wellington City coastline tend to be more abundant during autumn and winter, these peaks in abundance are caused by influxes of birds breeding in other parts of New Zealand and migrating to Wellington coastal waters during autumn and winter (Robertson 1992).

All surveys were carried out during fine weather, and in relatively calm sea conditions. During each survey, one or two observers traversed the foreshore, usually walking near or along the high tide mark, recording the identity and numbers of all birds seen or heard, including any birds encountered on the foreshore as well as any birds detected either offshore or further inland. Any birds seen flying overhead were also counted, provided they were flying in a direction perpendicular or opposite to the direction of travel of the observers. Birds flying in the same direction as the observers were not counted, to minimise the risk of double-counting birds. Special care was taken to systematically scan all areas of dry, un-vegetated gravels or sand on the foreshore, and any muddy backwaters, seepages, ponds, lagoons, rock pools, rock platforms, rocky islands and rock outcrops encountered along the coast to minimise the risk of missing key shorebird taxa such as dotterels, oystercatchers, gulls, terns and herons.

Separate counts were recorded for each 1 km section of coastline traversed, so that spatial patterns in the distribution and relative abundance of shorebirds could be mapped to a 1 km resolution. These 1 km sections were mapped out for the Wellington region in advance of the surveys and were aligned with Maritime New Zealand's Marine Oil Spill Risk Assessment Coast Cells (http://mosra18.navigatusconsulting.com/map, accessed 01/06/2021; Maritime New Zealand, unpublished data) to inform regional marine oil spill planning. A list containing the names and locations of 1 km section boundaries can be found in Appendix One of this report.

These survey data were entered into a Microsoft Excel™ spreadsheet which was then used to calculate species count totals and 7-year mean counts for each kilometre of coastline surveyed. A copy of this spreadsheet as well as the original hardcopy field datasheets were supplied to both Greater Wellington Regional Council and Wellington City Council, and the raw count data were also entered into the New Zealand eBird database, an open-access bird observation database jointly maintained by

Birds New Zealand and the Cornell Lab of Ornithology. Seven-year mean counts for key coastal shorebird species were imported into the software package ArcGIS Pro, which was used to prepare the distribution maps contained in this report.

Figure 2.1: Extent of the Pōneke / Wellington City coastline surveyed over six consecutive summers between 2018 and 2024.

2.2 Assessing the value of built structures as habitats for indigenous birds

During the 2024 coastal bird survey, separate counts of birds using a network of built structures constructed within Pōneke / Wellington City's coastal marine area were carried out. Prior to the 2024 survey, the presence and location of built structures within Pōneke / Wellington City's coastal marine area was mapped by manually examining satellite imagery in ArcGIS pro. The location and extent of each built structure identified was recorded in a point shapefile, with each point marking the approximate centroid (geometric centre) of each structure. Each of these structures were visited during the 2024 coastal bird survey and a systematic count of all birds occupying each structure was carried out, and the presence of any nests or dependent chicks was also recorded.

Data describing the presence birds on each of these structures was also sourced from the New Zealand eBird and iNaturalist databases. The New Zealand eBird database (http://ebird.org/content/newzealand/), which in turn hosts the New Zealand Bird Atlas dataset, is run by the Cornell Lab of Ornithology in partnership with Birds New Zealand (formerly the Ornithological Society of New Zealand). It provides a facility for recreational birdwatchers and professional ornithologists to permanently record their bird observations in a standard format in one centralised location and makes these observations available to researchers, conservation managers and environmental policy makers (Scofield *et al.* 2012). Globally, the eBird database is now the largest and fastest growing biodiversity database in the world, with over one million unique users having so far contributed over 1.9 billion bird observations (Sullivan *et al.* 2014; https://ebird.org/news/2024-year-in-review, accessed 24/05/2025).

Within the eBird database, automated data filters and an expert review process ensure that these data are of high quality and accuracy (Sullivan *et al*. 2014). We used eBird's "download data" tool to access the May 2025 release of the eBird Basic Dataset (EBD) and to build a custom dataset containing citizen science records of all native coastal bird species recorded within 100m of the Pōneke / Wellington City foreshore between 2018 and 2025. The location of the foreshore was defined using the New Zealand Coastline – Mean High Water dataset sourced from the Land Information New Zealand Data Service website[1]. We formatted this dataset using Microsoft Excel, including removing any extraneous data fields and converting latitude/longitude coordinates to New Zealand Transverse Mercator (NZTM2000) coordinates. We then saved the resulting files as a .csv file so that it could be imported into ArcGIS Pro and converted into shapefiles. Once in ArcGIS pro, we visually inspected these eBird records to locate and remove any records containing obvious location errors (e.g., records for which location descriptions didn't match the coordinates provided) or absence records). A total of 32,715 records of indigenous coastal birds observed within 100m of the Pōneke / Wellington City foreshore was retrieved from eBird using this process, representing 92% of all of the citizen science bird observations included in this report.

The iNaturalist New Zealand database is the second-largest online source of citizen science bird data for Pōneke / Wellington City. iNaturalist New Zealand is a database that allows citizen scientists to submit, share and store natural history observations online, and unlike eBird it is designed to accept records for almost any taxon of plant or animal rather than just birds. iNaturalist New Zealand (https://inaturalist.nz/) is run by a charitable trust called the New Zealand Bio-recording Network

[1] https://data.linz.govt.nz/layer/105085-nz-coastline-mean-high-water/; accessed 15/07/2024.

Trust and was established using funding from the New Zealand Government's Terrestrial Freshwater Biodiversity Information System Fund.

Within the iNaturalist New Zealand database, a community peer-review process is used to validate records, with records tagged as either "research grade" or "casual grade" depending on whether or not the original species identifications have been verified by other iNaturalist New Zealand users. We used the search tool on the iNaturalist New Zealand website (https://inaturalist.nz/) to create and download native coastal bird species recorded within 100m of the Pōneke / Wellington City foreshore between 2018 and 2025. We formatted this dataset using Microsoft Excel, then saved the resulting file as a .csv file so that it could be imported into ArcGIS Pro and converted to a shapefile. We then displayed the data on a map and visually inspected them, removing records with obvious location errors. A total of 2,792 records of native coastal birds observed within 100m of the Pōneke / Wellington City foreshore was retrieved from iNaturalist using this process, representing 8% of all of the citizen science bird observations included in this report.

Once these two datasets had been imported into ArcMap, they were combined into a single shapefile, and ArcMap's "clip" tool was used to extract only those citizen science bird observations that occurred within 100m of each of the built structures identified during our desktop analysis. The resulting dataset was then used to create lists of the indigenous coastal bird species that have been observed on, or in the close vicinity of each of the built structures identified.

The bird occurrence data collected from built structures during the 2024 coastal bird survey were combined with the citizen science data sourced from the New Zealand eBird and iNaturalist New Zealand databases to create a single dataset describing the occurrence of indigenous birds on built structures within the Pōneke / Wellington City coastal marine area. To create a means of ranking each of these built structures according to the habitat value each structure provides for Nationally or Regionally Threatened or At-Risk coastal bird species, the national and regional threat ranking of each bird species included in this dataset were given a score of between one and five depending on the severity of a species' threat ranking. Those species ranked as Nationally or Regionally Critical were given a score of five; species ranked as Nationally or Regionally Endangered a score of four; species ranked as Nationally or Regionally Vulnerable a score of three; Nationally or Regionally At-Risk species were given a score of two, and Nationally or Regional Migrants or Non-Threatened species were given a score of one. The scores of individual bird species recorded on, or within 100m of, each built structure were then summed, to provide an overall habitat value score for threatened bird species for each structure included in this analysis.

3. Results

3.1 Spatial patterns in species diversity

A total of 51 bird species have been detected during the seven annual surveys of the Pōneke / Wellington City coastline carried out between 2018 and 2024. No new bird species were detected during the 2024 coastal bird survey. A full list of the 51 bird species recorded during these surveys can be found Appendix Two of this report. Thirty-seven (73%) of the species detected are native to New Zealand and the remaining 15 species (27%) are introduced and naturalised species.

Twenty (39%) of the bird species detected are ranked as either Nationally Threatened or At Risk under the New Zealand Threat Classification System. These include one species ranked as Threatened - Nationally Endangered (matuku moana / reef heron); two species ranked as Threatened - Nationally Vulnerable (taranui / Caspian tern, *Hydroprogne caspia*; kawau tikitiki / spotted shag, *Phalacrocorax punctatus*) and one species ranked as Threatened - Nationally Increasing (kārearea / New Zealand falcon, *Falco novaeseelandiae*). Two further bird species detected are ranked as At Risk - Nationally Recovering; three species are ranked as At Risk - Nationally Relict; one species is ranked as At Risk - Nationally Naturally Uncommon and nine species are ranked as At Risk - Nationally Declining (Robertson *et al.* 2021; Appendix Two).

Seventeen (33%) of the bird species detected are ranked as Regionally Threatened under the New Zealand Threat Classification System, including seven species ranked as Threatened - Regionally Critical (pakahā / fluttering shearwater, *Puffinus gavia*; māpunga / black shag, *Phalacrocorax carbo*; kawau tikitiki / spotted shag; matuku moana / reef heron; kārearea / NZ falcon; tarāpuka / black-billed gull, *Chroicocephalus bulleri* and taranui / Caspian tern), seven species ranked as Threatened - Regionally Endangered (tōrea pango / variable oystercatcher, *Haematopus unicolor*; pohowera / banded dotterel; kawaupaka / little shag; kawau tūi / little black shag, *Phalacrocorax sulcirostris*; kōtuku ngutupapa / royal spoonbill (*Platalea regia*); tara / white-fronted tern and pīhoihoi / New Zealand pipit, *Anthus novaeseelandiae*) and three species ranked as Threatened - Regionally Vulnerable (kororā / little penguin, *Eudyptula minor*; kāruhiruhi / pied shag, *Phalacrocorax varius*; and tarāpunga / red-billed gull (Crisp *et al.* 2024; Appendix Two).

The local species richness of indigenous bird species appears to be fairly uniform along the Pōneke / Wellington City coastline. Local species richness is relatively low along sections of shoreline that have been 'hardened' by land reclamation or the construction of seawalls, including the coast between Petone and Ngauranga, the Evans Bay foreshore and the seawall at the southern end of the Wellington International Airport runway. Local species richness is comparatively high along the remainder of the coast, including in highly urbanised areas such as the Wellington CBD foreshore. The eastern coastline of Te Motu Kairangi / Miramar Peninsula and the Taputeranga Marine Reserve foreshore in Island and Owhiro Bays both support relatively high numbers of indigenous bird species (Figure 3.1).

Figure 3.1: Mean number of indigenous bird species recorded per 1 km survey section along the Pōneke / Wellington City coastline during six consecutive annual surveys carried out between 2018 and 2024.

3.2 Abundance and distribution of coastal bird species

This section of the report summarises the abundance and distribution of 11 of the 37 indigenous bird species that have been detected along the Pōneke / Wellington City coastline during these surveys since 2018. The 11 species chosen are all ranked as Regionally Threatened under the New Zealand Threat Classification System; are largely restricted to coastal and freshwater habitats and are either resident, or annual visitors to, the Pōneke / Wellington City coastline. Other Regionally Threatened indigenous bird species that occupy Wellington's coastal waters but seldom occur on land (e.g., pakahā / fluttering shearwater and tākapu / Australasian gannet, *Morus serrator*); species that are widespread in adjacent terrestrial habitats (e.g., kārearea / NZ falcon and tūī, *Prosthemadera novaeseelandiae*), and coastal species that are irregular visitors to the Pōneke / Wellington City coastline have been excluded from this section but are all listed in Appendix Two of this report.

3.2.1 Kawaupaka / Little shag (*Microcarbo melanoleucos*)

Image courtesy of Peter Reese/NZ Birds Online

National conservation status:
At Risk, Relict (Robertson *et al.* 2021)

Regional conservation status:
Regionally Endangered (Crisp *et al.* 2024)

A mean of 26.3 kawaupaka / little shags (range: 7-44 birds) have been counted along the Pōneke / Wellington City coastline each year during the seven annual surveys carried out between 2018 and 2024. Despite year-to-year fluctuations in the number of birds counted, there has been no overall increase or decrease in the number of kawaupaka / little shags counted each year over this period (Figure 3.2).

Kawaupaka / little shags are widespread along the Pōneke / Wellington City coastline, with noticeably higher densities present along the Wellington CBD, Evans Bay and northern Te Motu Kairangi / Miramar Peninsula foreshores (Figure 3.3). An average of 0.48 kawaupaka / little shags were recorded per 1 km survey section along the Pōneke / Wellington City coastline between 2018 and 2024, which is 1.4 times the average density of 0.35 birds recorded along 460 km of the Wellington region coastline during 2022-2023 (McArthur 2025). Kawaupaka / little shag numbers in Te Whanganui-a-Tara / Wellington Harbour are at their annual minimum at the time that these surveys are carried out, with numbers climbing steadily from March onwards to reach an annual peak between May and August. Total numbers of kawaupaka / little shags present in Te Whanganui-a-Tara / Wellington Harbour during winter far exceed the size of breeding colonies present in the Wellington region, so many of these winter visitors must be arriving from breeding sites outside of the Wellington region (Robertson 1992).

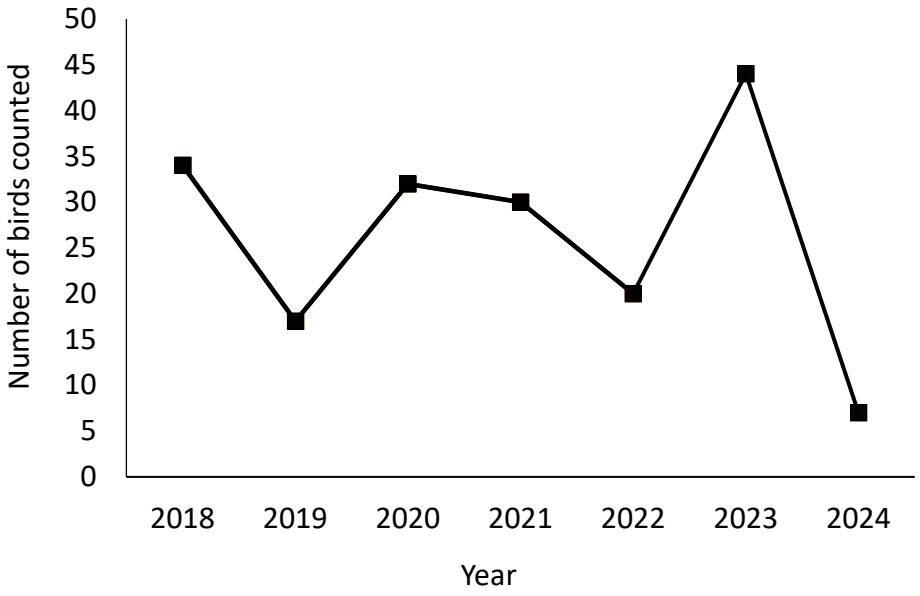

Figure 3.2: Changes in the total number of kawaupaka / little shags counted along the Pōneke / Wellington City coastline each year between 2018 and 2024.

Figure 3.3: Patterns in the distribution and abundance of kawaupaka / little shags along the Pōneke / Wellington City coastline between 2018 and 2024.

3.2.2 Māpunga / Black shag (*Phalacrocorax carbo*)

Image courtesy of Ormond Torr/NZ Birds Online

National conservation status:
At Risk, Relict (Robertson *et al.* 2021)

Regional conservation status:
Regionally Critical (Crisp *et al.* 2024)

A mean of 5.7 māpunga / black shags (range: 3-9 birds) have been counted along the Pōneke / Wellington City coastline each year during the seven annual surveys carried out between 2018 and 2024. Despite year-to-year fluctuations in the number of birds counted, there has been no overall increase or decrease in the number of māpunga / black shags counted each year over this period (Figure 3.4).

Māpunga / black shags are uncommon along the Pōneke / Wellington City coastline and have only been recorded during these surveys at the northern tip of Te Motu Kairangi / Miramar Peninsula, in Island and Houghton Bays and along the Wellington south coast between Oteranga Bay and Te Rimurapa / Sinclair Head (Figure 3.5). An average of 0.1 māpunga / black shags were recorded per 1 km survey section along the Pōneke / Wellington City coastline between 2018 and 2024, which is 73% lower than the average density of 0.38 birds recorded along 460 km of the Wellington region coastline during 2022-2023 (McArthur 2025). No māpunga / black shag nesting colonies have been located along the Pōneke / Wellington City coastline during these surveys, however several pairs have nested on the lower reservoir in Zealandia Te Māra a Tāne since 2009[2]. Māpunga / black shag numbers in Te Whanganui-a-Tara / Wellington Harbour are relatively stable all year around, with a minor influx of birds occurring in autumn (Robertson 1992).

Māpunga / black shags and kāruhiruhi / pied shags now appear to have an almost mutually exclusive distribution along the Wellington region coastline, with māpunga / black shags being considerably more common along the Wairarapa coastline, whereas kāruhiruhi / pied shags are much more common along the Pōneke / Wellington City and Kāpiti coastlines. This suggests that some form of competitive exclusion may be occurring between these two species in coastal habitats in the region, with kāruhiruhi / pied shags being the more dominant of the two species (McArthur 2025).

[2] https://www.visitzealandia.com/About/Wildlife/Birds/Black-Shag; accessed 12/06/2023.

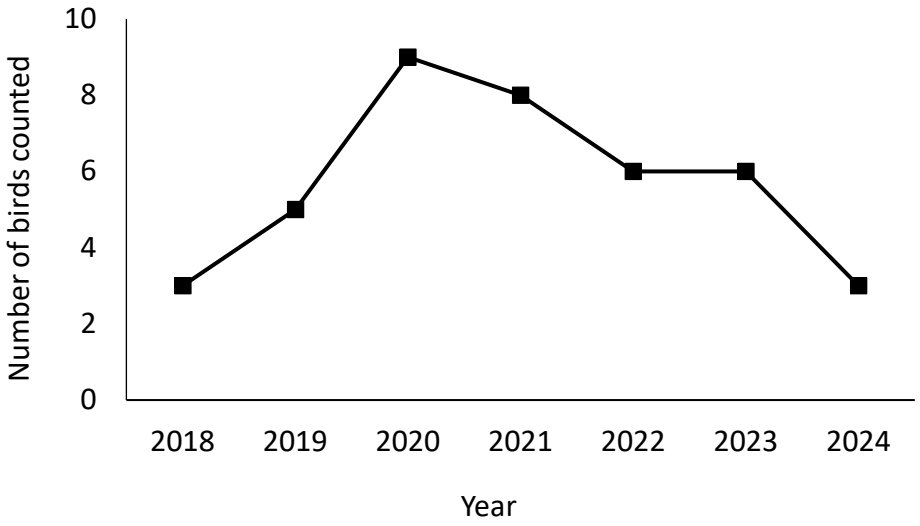

Figure 3.4: Changes in the total number of māpunga / black shags counted along the Pōneke / Wellington City coastline each year between 2018 and 2024.

Figure 3.5: Patterns in the distribution and abundance of māpunga / black shags along the Pōneke / Wellington City coastline between 2018 and 2024.

3.2.3 Kāruhiruhi / Pied shag (*Phalacrocorax varius*)

Image courtesy of Peter Reese/NZ Birds Online

National conservation status: At Risk, Recovering (Robertson *et al.* 2021)

Regional conservation status: Regionally Vulnerable (Crisp *et al.* 2024)

A mean of 31.4 kāruhiruhi / pied shags (range: 23-37 birds) have been counted along the Pōneke / Wellington City coastline each year during the seven annual surveys carried out between 2018 and 2024. The number of kāruhiruhi / pied shags counted each year has been remarkably consistent between 2018 and 2024, with no overall increase or decrease in numbers over this period (Figure 3.6).

Kāruhiruhi / pied shags are fairly uniformly distributed along the Wellington south coast and along the south-eastern coastline of Te Motu Kairangi / Miramar Peninsula but appear to be less common in the inner harbour (Figure 3.7). A total of 439 kāruhiruhi / pied shags were counted along 460 km of the Wellington region coastline during 2022-2023 (McArthur 2025), so the mean count of 31.4 birds recorded along the 55 km of Pōneke / Wellington City coastline surveyed represents 7% of the regional summer population of kāruhiruhi / pied shags. An average of 0.6 kāruhiruhi / pied shags were recorded per 1 km survey section along the Pōneke / Wellington City coastline between 2018 and 2024, which is 37% lower than the average density of 0.95 birds recorded along 460 km of the Wellington region coastline during 2022-2023 (McArthur 2025).

Kāruhiruhi / pied shags have re-colonised the Wellington coastline comparatively recently, with the first breeding colony becoming established at the Mākara Estuary in 1996 (Powlesland *et al.* 2008; Bell 2013). Kāruhiruhi / pied shags and māpunga / black shags now have an almost mutually exclusive distribution along the Wellington region coastline, suggesting that some form of competitive exclusion may be occurring between these two species in coastal habitats in the region, with kāruhiruhi / pied shags being the more dominant of the two species (McArthur 2025).

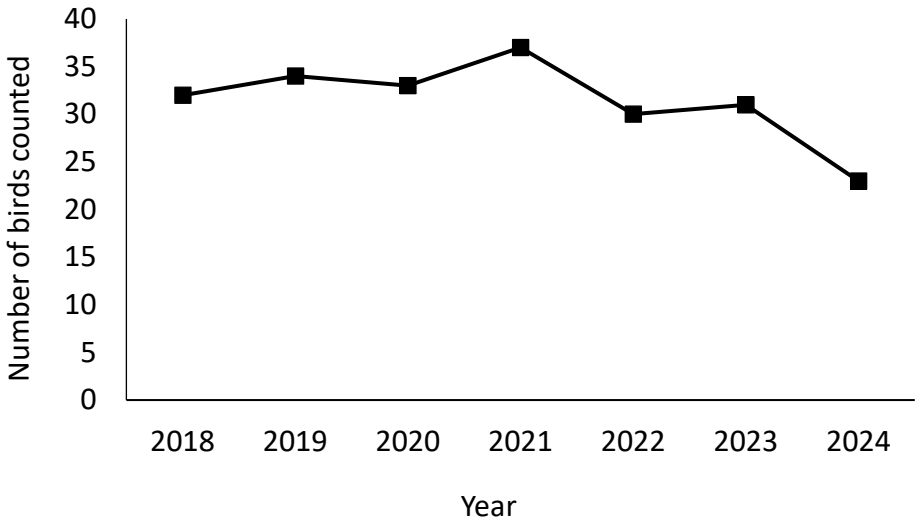

Figure 3.6: Changes in the total number of kāruhiruhi / pied shags counted along the Pōneke / Wellington City coastline each year between 2018 and 2024.

Figure 3.7: Patterns in the distribution and abundance of kāruhiruhi / pied shags along the Pōneke / Wellington City coastline between 2018 and 2024.

3.2.4 Kawau tūī / Little black shag (*Phalacrocorax sulcirostris*)

Image courtesy of Glenn Pure/NZ Birds Online

National conservation status:
At Risk, Naturally Uncommon (Robertson *et al.* 2021)

Regional conservation status:
Regionally Endangered (Crisp *et al.* 2024)

A mean of 1.0 kawau tūī / little black shags (range: 0-3 birds) has been counted along the Pōneke / Wellington City coastline each year during the seven annual surveys carried out between 2018 and 2024. The majority of these birds have been recorded in the CBD and Evans Bay foreshores (Figure 3.9). The mooring ropes of the historic floating crane *Hikitia,* moored at Taranaki Wharf near the Museum of New Zealand Te Papa Tongarewa is a particularly favoured roost site for this species in Pōneke / Wellington City (Figure 3.8).

Kawau tūī / little black shag numbers in Te Whanganui-a-Tara / Wellington Harbour are at their annual minimum at the time that these surveys are carried out, with numbers climbing steadily from April onwards to reach an annual peak between May and August. Total numbers of kawau tūī / little black shags present in Te Whanganui-a-Tara / Wellington Harbour during winter far exceed the size of the region's single breeding colony present at Matthews Lagoon near the eastern shoreline of Lake Wairarapa, so many of these winter visitors must be arriving from breeding sites outside of the Wellington region (Robertson 1992).

Figure 3.8: Eight kawau tūī / little black shags roosting on the mooring ropes of the *Hikitea*, moored at Taranaki Wharf, on the 14th of June 2017 (Image credit: Duncan Watson).

Figure 3.9: Patterns in the distribution and abundance of kawau tūī / little black shags along the Pōneke / Wellington City coastline between 2018 and 2024.

3.2.5 Kawau tikitiki / Spotted shag (*Phalacrocorax punctatus*)

Image courtesy of Ormond Torr/NZ Birds Online

National conservation status:
Nationally Vulnerable (Robertson *et al.* 2021)

Regional conservation status:
Regionally Critical (Crisp *et al.* 2024)

A mean of 5.4 kawau tikitiki / spotted shags (range: 1-14 birds) have been counted along the Pōneke / Wellington City coastline each year during the seven annual surveys carried out between 2018 and 2024. Despite year-to-year fluctuations in the number of birds counted each year, there has been no overall increase or decrease in the number of kawau tikitiki / spotted shags counted each year over this period (Figure 3.10).

The majority of the kawau tikitiki / spotted shags counted during this survey have been encountered along the inner harbour foreshore, including the Wellington City CBD, Evans Bay and northern Te Motu Kairangi / Miramar Peninsula foreshore, which likely reflects the proximity of these areas to the breeding colony present on Matiu/Somes Island (Figure 3.11; Waugh *et al.* 2013). A small number of kawau tikitiki / spotted shags are also known to nest on rock stacks at Port Dorset (e.g., Hodge 2020), the only site on the mainland Wellington region coastline where this species is known to nest (McArthur 2025). Numbers of kawau tikitiki / spotted shags in Te Whanganui-a-Tara / Wellington Harbour are at their annual minimum at the time that these surveys are carried out, with numbers climbing steadily from March onwards to reach an annual peak between April and August each year (Robertson 1992).

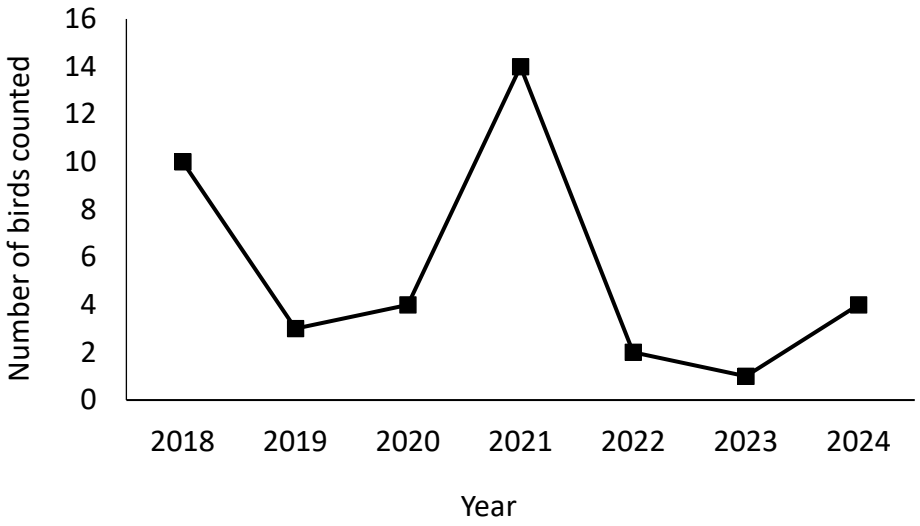

Figure 3.10: Changes in the total number of kawau tikitiki / spotted shags counted along the Pōneke / Wellington City coastline each year between 2018 and 2024.

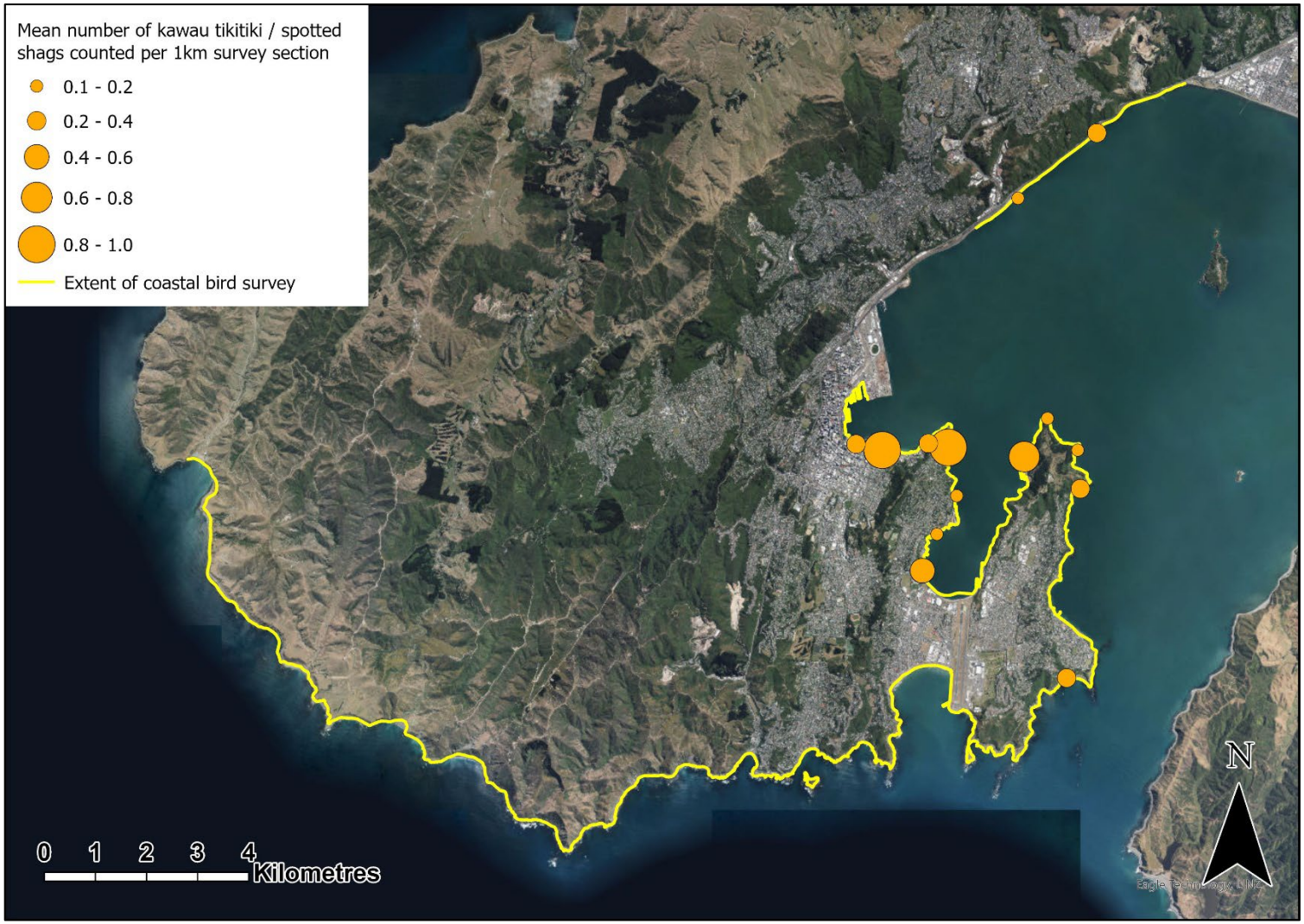

Figure 3.11: Patterns in the distribution and abundance of kawau tikitiki / spotted shags along the Pōneke / Wellington City coastline between 2018 and 2024.

3.2.6 Matuku moana / Reef heron (*Egretta sacra*)

Image courtesy of Duncan Watson/NZ Birds Online

National conservation status:
Nationally Endangered (Robertson *et al.* 2021)

Regional conservation status:
Regionally Critical (Crisp *et al.* 2024)

A mean of 2.9 matuku moana / reef herons (range: 2-5 birds) have been counted along the Pōneke / Wellington City coastline each year during the seven annual surveys carried out between 2018 and 2024. Despite year-to-year fluctuations in the number of birds counted each year, there has been no overall increase or decrease in the number of matuku moana / reef herons counted each year over this period (Figure 3.12).

Matuku moana / reef herons are largely restricted to Island Bay and adjacent sections of the Wellington south coast between Tongue Point and Palmer Head (Figure 3.14), although they are occasionally encountered elsewhere along the Pōneke / Wellington City coastline, including along the Wellington CBD foreshore (eBird 2025). This survey has confirmed that matuku moana / reef herons have bred successfully on Taputeranga Island during at least three of the past seven years (Figure 3.13), as they have in previous years at this site (Bell 2017). Breeding attempts have also occurred on both Matiu/Somes and Mākaro/Ward Islands in Te Whanganui-a-Tara / Wellington Harbour in recent years (Birds New Zealand unpublished data).

Unlike the closely related matuku moana / white-faced heron (*Egretta novaehollandiae*), the matuku moana / reef heron is entirely restricted to coastal habitats (Heather & Robertson 2015). A total of 17 matuku moana / reef herons were counted along 460 km of the Wellington region coastline during 2022-2023 (McArthur 2015), confirming that the matuku moana / reef heron remains one of the Wellington region's rarest resident breeding bird species. The mean count of 2.9 matuku moana / reef herons counted along the Pōneke / Wellington City coastline between 2018 and 2024 therefore represents 17% of the regional breeding population of this species. Matuku moana / reef heron numbers in Te Whanganui-a-Tara / Wellington Harbour have apparently declined since the mid-1970s, during which time an estimated six breeding pairs were present (Edgar 1978). Recent Te Whanganui-a-Tara / Wellington Harbour bird surveys carried out by Birds New Zealand, together with the results of this survey, suggest that the current breeding population of matuku moana / reef herons in the harbour is now less than half of this 1975 estimate.

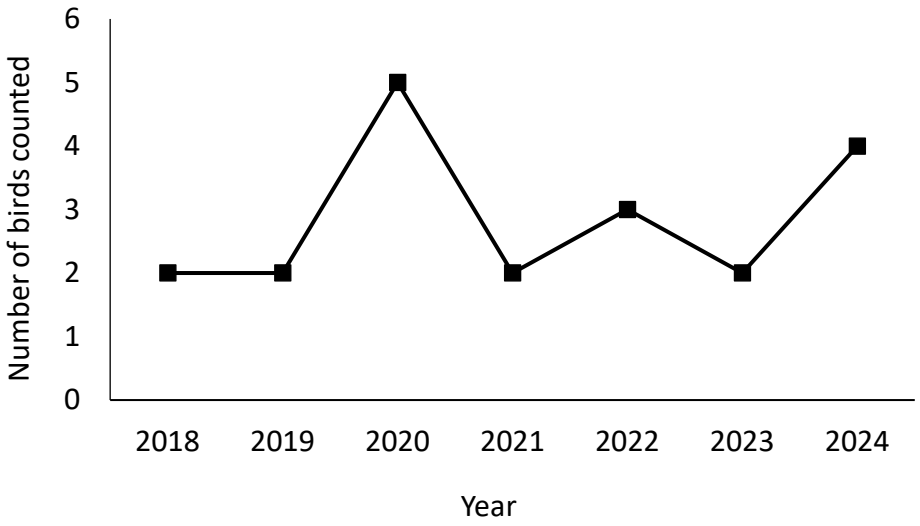

Figure 3.12: Changes in the total number of matuku moana / reef herons counted along the Pōneke / Wellington City coastline each year between 2018 and 2024.

Figure 3.13: Juvenile matuku moana / reef heron (left hand bird) with two adults observed on Taputeranga Island, Island Bay on the 15th of December 2018. The juvenile can be distinguished by its pale grey bill and legs, in comparison to the pale yellow bill and legs of the adults (image credit: Jonathan Walter).

Figure 3.14: Patterns in the distribution and abundance of matuku moana / reef herons along the Pōneke / Wellington City coastline between 2018 and 2024.

3.2.7 Tōrea pango / Variable oystercatcher (*Haematopus unicolor*)

Image courtesy of Tony Crocker/NZ Birds Online

National conservation status: At Risk, Recovering (Robertson *et al.* 2021)

Regional conservation status: Regionally Endangered (Crisp *et al.* 2024)

A mean of 88.4 tōrea pango / variable oystercatchers (range: 74-105 birds) have been counted along the Pōneke / Wellington City coastline each year during the seven annual surveys carried out between 2018 and 2024. The number of tōrea pango / variable oystercatchers counted each year has been fairly consistent between 2018 and 2024, with no overall increase or decrease in numbers over this period (Figure 3.15).

Tōrea pango / variable oystercatchers appear to be fairly evenly distributed along the Pōneke / Wellington City coastline but occur at lower densities on coastlines adjacent to urban areas including in Lyall and Evans Bays, at Seatoun and in Kilbirnie and the Wellington CBD. Tōrea pango / variable oystercatchers also occur at lower densities along sections of shoreline that have been 'hardened' by land reclamation or the construction of seawalls, such as the coastline between Petone and Ngauranga. In contrast, tōrea pango / variable oystercatcher densities appear to be relatively high along the north-eastern coastline of Te Motu Kairangi / Miramar Peninsula; at Moa Point and on the Wellington south coast between Waitaha Cove (in western Lyall Bay) and Owhiro Bay (Figure 3.16).

A total of 664 tōrea pango / variable oystercatchers were counted along 460 km of the Wellington region coastline during 2022-2023 (McArthur 2025), so the mean count of 88.4 birds recorded along the 55 km of Pōneke / Wellington City coastline surveyed represents 13% of the regional tōrea pango / variable oystercatcher population. An average of 1.6 tōrea pango / variable oystercatchers were recorded per 1 km survey section along the Pōneke / Wellington City coastline between 2018 and 2024, which is 14% higher than the average density of 1.4 birds per kilometre recorded along 460 km of the Wellington region coastline during 2022-2023 (McArthur 2025).

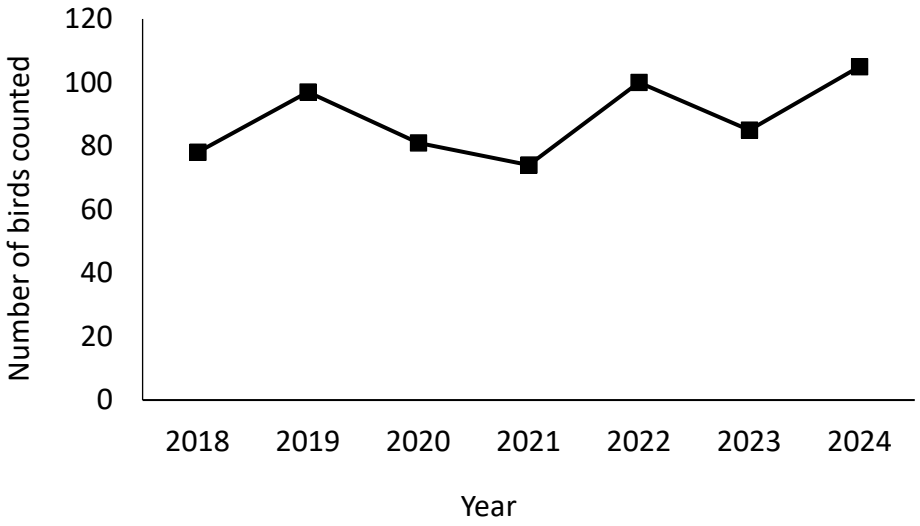

Figure 3.15: Changes in the total number of tōrea pango / variable oystercatchers counted along the Pōneke / Wellington City coastline each year between 2018 and 2024.

Figure 3.16: Patterns in the distribution and abundance of tōrea pango / variable oystercatchers along the Pōneke / Wellington City coastline between 2018 and 2024.

3.2.8 Pohowera / Banded dotterel (*Anarhynchus bicinctus*)

Image courtesy of Rebecca Bowater/NZ Birds Online

National conservation status: At Risk, Declining (Robertson *et al.* 2021)

Regional conservation status:
Regionally Endangered (Crisp *et al.* 2024)

A mean of 26.3 pohowera / banded dotterels (range: 16-33 birds) have been counted along the Pōneke / Wellington City coastline each year during the seven annual surveys carried out between 2018 and 2024. With the exception of a low count of 16 pohowera / banded dotterels recorded during the 2024 survey, the number of pohowera / banded dotterels counted each year has been fairly consistent between 2018 and 2024 with no overall increase or decrease in numbers over this period (Figure 3.17).

Pohowera / banded dotterels are very localised along the Pōneke / Wellington City coastline, with one small population situated at the southern end of the Wellington International Airport runway, and another larger population on the Wellington south coast between Oteranga Bay and Te Rimurapa / Sinclair Head (Figure 3.18). Approximately 572 adult pohowera / banded dotterels are estimated to be present in the Wellington region, with 258 of these found along the Wellington region coastline and the remainder found along the region's braided rivers (McArthur 2025). The mean of 26.3 pohowera / banded dotterels counted along the 55 km of Pōneke / Wellington City coastline surveyed therefore represents 5% of the regional population and 10% of the pohowera / banded dotterels that occur in coastal habitats in the Wellington region.

Around the Wellington region coastline, the majority of pohowera / banded dotterels are clustered into a small number of local breeding populations, with the Wellington south coast population being the fourth largest coastal population in the region, after Ōnoke Spit, Baring Head/Ōrua-pouanui and the Parangarahu Lakes (McArthur 2020a; McArthur *et al.* 2021b). Recent banding work carried out by Birds New Zealand and MIRO (Mainland Island Restoration Organisation) has demonstrated that there is some movement of birds between each of these local coastal breeding populations. For example, a female pohowera / banded dotterel that was banded as a chick at the Parangarahu Lakes on the 9th of January 2020 was recovered dead on the Wellington International Airport runway three months later on the 15th of April 2021. A post-mortem of the remains suggested that this bird may have been depredated by a cat (MIRO / Birds New Zealand unpublished data). A second pohowera / banded dotterel banded as a fledgling on the Eastbourne foreshore on the 12th of January 2021 was re-sighted alive at the southern end of Wellington International Airport on the 11th of December 2021. This latter bird (a male) was paired with a female bird and was likely to have been guarding chicks (N. McArthur *personal observation*).

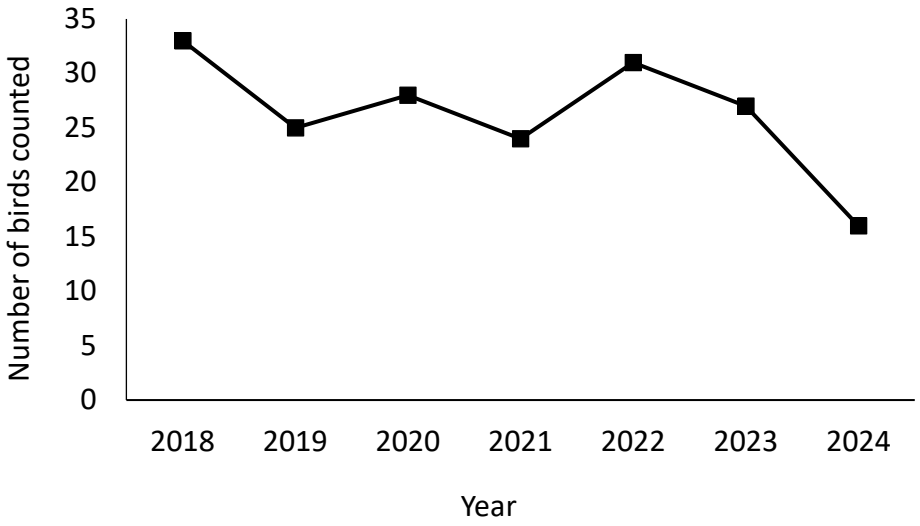

Figure 3.17: Changes in the total number of pohowera / banded dotterels counted along the Pōneke / Wellington City coastline each year between 2018 and 2024.

Figure 3.18: Patterns in the distribution and abundance of pohowera / banded dotterels along the Pōneke / Wellington City coastline between 2018 and 2024.

3.2.9 Tarāpunga / Red-billed gull (*Chroicocephalus novaehollandiae*)

Image courtesy of Alan Tennyson/NZ Birds Online

National conservation status: At Risk, Declining (Robertson *et al.* 2021)

Regional conservation status: Regionally Vulnerable (Crisp *et al.* 2024)

A mean of 560 tarāpunga / red-billed gulls (range: 353-810 birds) have been counted along the Pōneke / Wellington City coastline each year during the seven annual surveys carried out between 2018 and 2024. There appears to have been no overall trend in the number of tarāpunga / red-billed gulls counted each year between 2018 and 2024, although particularly high counts were recorded in 2019, 2023 and 2024. (Figure 3.19).

The particularly high count during the 2024 survey was caused by the presence of two sizeable nesting colonies along the Pōneke / Wellington City coastline that year, one situated on rock stacks and cliff faces on the Oruaiti Reserve foreshore, and another on Taputeranga Island. The Oruaiti Reserve nesting colony has been active each summer between 2018 and 2024, whereas the nesting colony on Taputeranga Island has only been present during the 2022 and 2024 surveys.

Tarāpunga / red-billed gulls are fairly uniformly distributed along the Pōneke / Wellington city coastline, although they appear to occur at lower densities to the west of Te Rimurapa / Sinclair Head and in Evans Bay (Figure 3.20). Tarāpunga / red-billed gull numbers in Te Whanganui-a-Tara / Wellington Harbour are at their annual minimum at the time that these surveys are carried out, with numbers climbing to reach an annual peak between May and August. Many birds banded at both Kaikōura and at Lake Grassmere have been recorded in Te Whanganui-a-Tara / Wellington Harbour at this time of the year, indicating that many of the birds encountered during this autumn and winter influx breed at South Island breeding colonies (Robertson 1992).

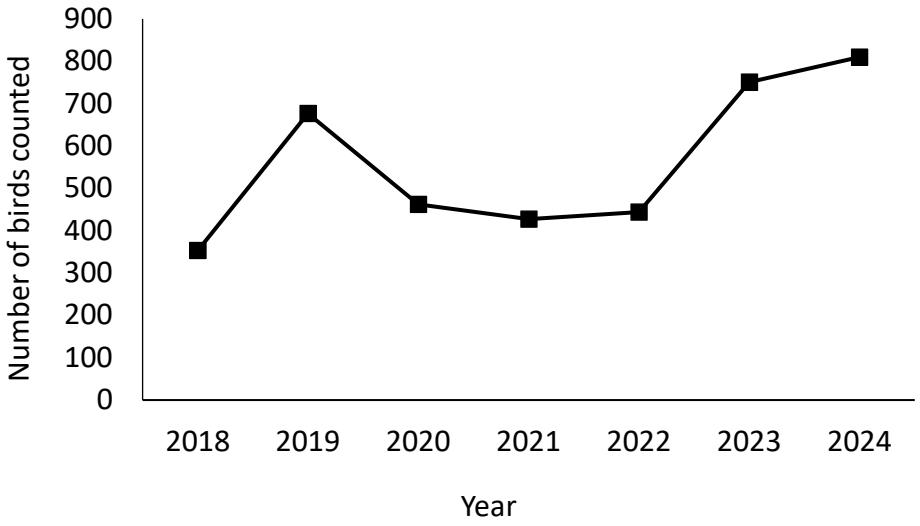

Figure 3.19: Changes in the total number of tarāpunga / red-billed gulls counted along the Pōneke / Wellington City coastline each year between 2018 and 2024.

Figure 3.20: Patterns in the distribution and abundance of tarāpunga / red-billed gulls along the Pōneke / Wellington City coastline between 2018 and 2024.

3.2.10 Tara / White-fronted tern (*Sterna striata*)

Image courtesy of Rebecca Bowater/NZ Birds Online

National conservation status: At Risk, Declining (Robertson *et al.* 2021)

Regional conservation status: Regionally Endangered (Crisp *et al.* 2024)

A mean of 230 tara / white-fronted terns (range: 36-751 birds) have been counted along the Pōneke / Wellington City coastline each year during the seven annual surveys carried out between 2018 and 2024. The number of birds counted has fluctuated substantially from year to year, with an exceptionally high count of 751 birds recorded during the 2023 survey. Despite this year-to-year variation in numbers, there does not appear to have been any overall increase or decrease in the number counted between 2018 and 2024 (Figure 3.21).

A small nesting colony has been present on rock stacks and cliff faces on the Oruaiti Reserve foreshore each year and is the only tara / white-fronted tern colony that has been found along the mainland Pōneke / Wellington City coastline during these surveys. Two obvious hotspots in tara / white-fronted tern abundance are associated with the Oruaiti Reserve nesting colony and with the concrete seawalls of Chaffers Marina, the latter of which is a favoured roost site for this species in the inner harbour (Figure 3.26). Tara / white-fronted terns are otherwise fairly uniformly distributed along the Pōneke / Wellington City coastline, although they appear to occur at much lower densities to the west of Owhiro Bay. (Figure 3.22). Interestingly, these apparently low densities of tara / white-fronted terns present along the Wellington south coast have been detected as far back as the mid-1970s and appear to occur year-round (Robertson 1992), indicating that the south coast provides lower habitat quality for this species in comparison to the inner harbour. Tara / white-fronted tern numbers in Te Whanganui-a-Tara / Wellington Harbour are at their annual minimum at the time that these surveys are carried out, with numbers climbing to reach an annual peak between March and May, just prior to their autumn migration to Australia (Robertson 1992).

Seven tara / white-fronted tern colonies have been detected along 460 km of the Wellington region coastline since 2017, on Kāpiti, Mana and Mākaro/Ward Islands; at the Waikanae Estuary as well as on the Oruaiti Reserve foreshore on Te Motu Kairangi / Miramar Peninsula, and at Te Awaiti and Honeycomb Rock in the eastern Wairarapa (McArthur *et al.* 2019; McArthur 2025). Given that five of these seven colonies were found along the Pōneke / Wellington City, Porirua and Kāpiti coastlines, it appears that the west coast of the Wellington region, including the Pōneke / Wellington City coastline, is a regional stronghold for this species.

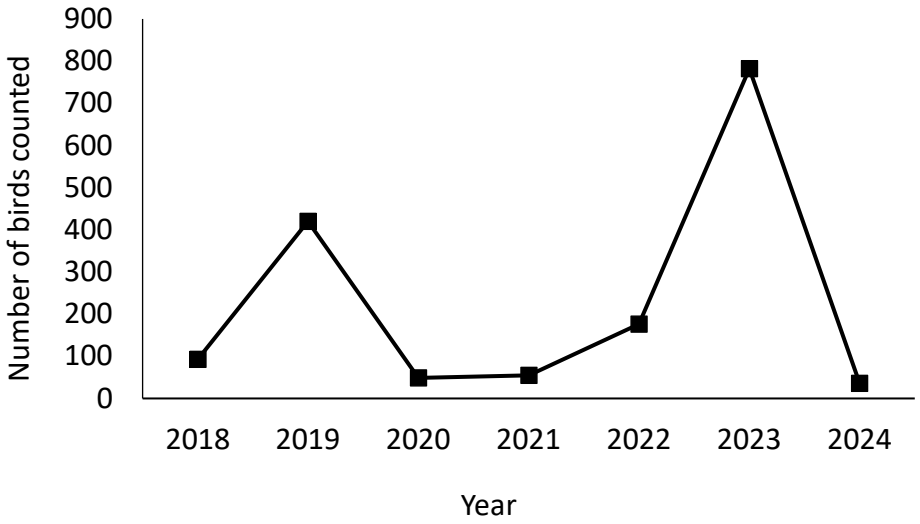

Figure 3.21: Changes in the total number of tara / white-fronted terns counted along the Pōneke / Wellington City coastline each year between 2018 and 2024.

Figure 3.22: Patterns in the distribution and abundance of tara / white-fronted terns along the Pōneke / Wellington City coastline between 2018 and 2024.

3.2.11 Pīhoihoi / New Zealand pipit (*Anthus novaeseelandiae*)

Image courtesy of Duncan Watson/NZ Birds Online

National conservation status: At Risk, Declining (Robertson *et al.* 2021)

Regional conservation status: Regionally Endangered (Crisp *et al.* 2024)

A mean of 10.7 pīhoihoi / New Zealand pipits (range: 7-13 birds) have been counted along the Pōneke / Wellington City coastline each year during the seven annual surveys carried out between 2018 and 2024. The number of birds counted has fluctuated from year to year, although there has not been any overall increase or decrease in the number counted between 2018 and 2024 (Figure 3.23).

Within the survey area, pīhoihoi / New Zealand pipits appear to be entirely restricted to the Wellington south coast between Owhiro and Oteranga Bays (Figure 3.24), however they are also regularly recorded by citizen scientists along the coastline as far east as Island Bay, and occasionally from Te Raekaihau Point and the southern coast of Te Motu Kairangi / Miramar Peninsula (eBird 2025). A total of 110 pīhoihoi / New Zealand pipits were counted along 460 km of the Wellington region coastline during 2022-2023 (McArthur 2025), so the mean count of 10.7 birds recorded along the 55 km of Pōneke / Wellington City coastline surveyed represents 10% of the regional coastal population of pīhoihoi / New Zealand pipits. An average of 0.19 pīhoihoi / New Zealand pipits were recorded per 1 km survey section along the Pōneke / Wellington City coastline between 2018 and 2024, which is 26% lower than the average density of 0.23 birds recorded along 460 km of the Wellington region coastline during 2022-2023 (McArthur 2025).

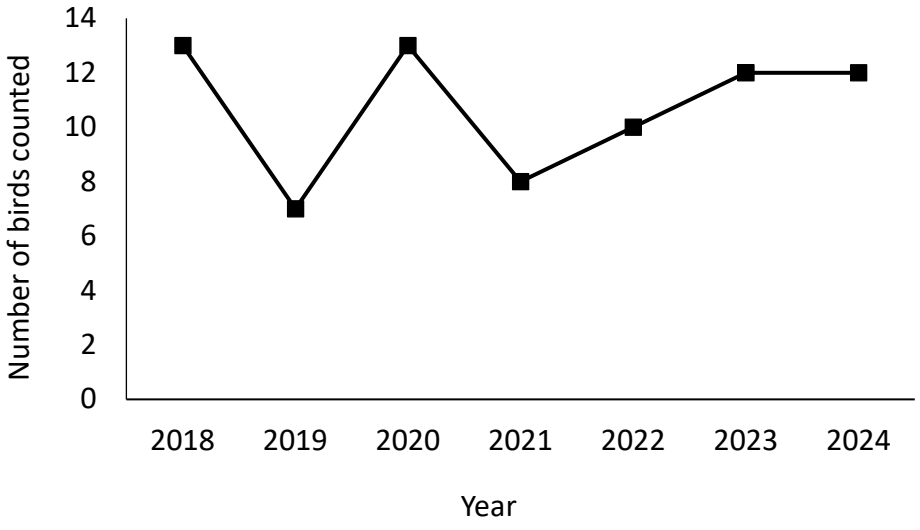

Figure 3.23: Changes in the total number of pīhoihoi / New Zealand pipits counted along the Pōneke / Wellington City coastline each year between 2018 and 2024.

Figure 3.24: Patterns in the distribution and abundance of pīhoihoi / New Zealand pipits along the Pōneke / Wellington City coastline between 2018 and 2024.

3.3 An assessment of the coastal bird habitat values of built structures on the Pōneke / Wellington City foreshore

A total of 67 built structures situated on the Pōneke / Wellington City foreshore were identified as having potential habitat value for indigenous coastal bird species and were systematically surveyed for the first time in 2024. These structures include sections of rock rip-rap, seawalls, wharves, jetties, boat ramps, lighthouses and marinas (Figure 3.25; Table 3.1).

Since 2018, citizen scientists have recorded the presence of indigenous coastal birds on, or within 100m of, 52 of these 67 structures. Combining these citizen science records with the survey data collected during the 2024 coastal bird survey has allowed these structures to be ranked according to indigenous species diversity, and both the National and Regional threat status of the species present (Table 3.1).

The top ten structures providing habitat for indigenous coastal birds, including relatively high numbers of both Nationally and Regionally Threatened and At Risk species all occur within the inner harbour, possibly indicating the built structures within the inner harbour have comparatively high habitat values for coastal birds (Table 3.1; Figure 3.25). This may indeed be the case considering the highly modified nature of the inner harbour foreshore, however these structures also have comparativley high levels of public access and public use, indicating that these relatively high rankings may simply reflect high levels of local citizen science observation effort. Indeed, a number of built structures situated in the inner harbour that have no public access, including King's Wharf, Railway Wharf and the now-dismantled derelict wharves and jetties in Shelly Bay on Te Motu Kairangi / Miramar Peninsula have all ranked comparively low among the 67 structures assessed, indicating that these rankings may indeed be biased by their accessibility (Table 3.1).

Built structures on the Pōneke / Wellington City foreshore appear to play a significant role in providing roosting habitat for a range of coastal bird species, including gulls, terns, shags and oystercatchers. For example, during late summer, the seawalls of Chaffers Marina attract flocks of several hundred roosting tara / white-fronted terns (Figure 3.26). Structures that are inaccessible to people appear to be high value roosting habitats for coastal birds, presumably due to the fact that the birds roosting on these structures are seldom disturbed by people. For this reason, those structures that are situated entirely in the water (Figure 3.27) or those of which people are prohibited from accessing due to safety reasons (Figure 3.28) appear to provide the best roosting habitat for coastal birds. In contrast, built structures appear to play a less significant role in providing nesting habitat for native coastal birds along the Pōneke / Wellington City coastline. Small numbers of both karoro / black-backed gulls and tōrea pango / variable oystercatchers have been observed nesting on seawalls and wharves, but no shag, gull or tern colonies have been recorded on built structures situated on the Pōneke / Wellington City foreshore in recent years.

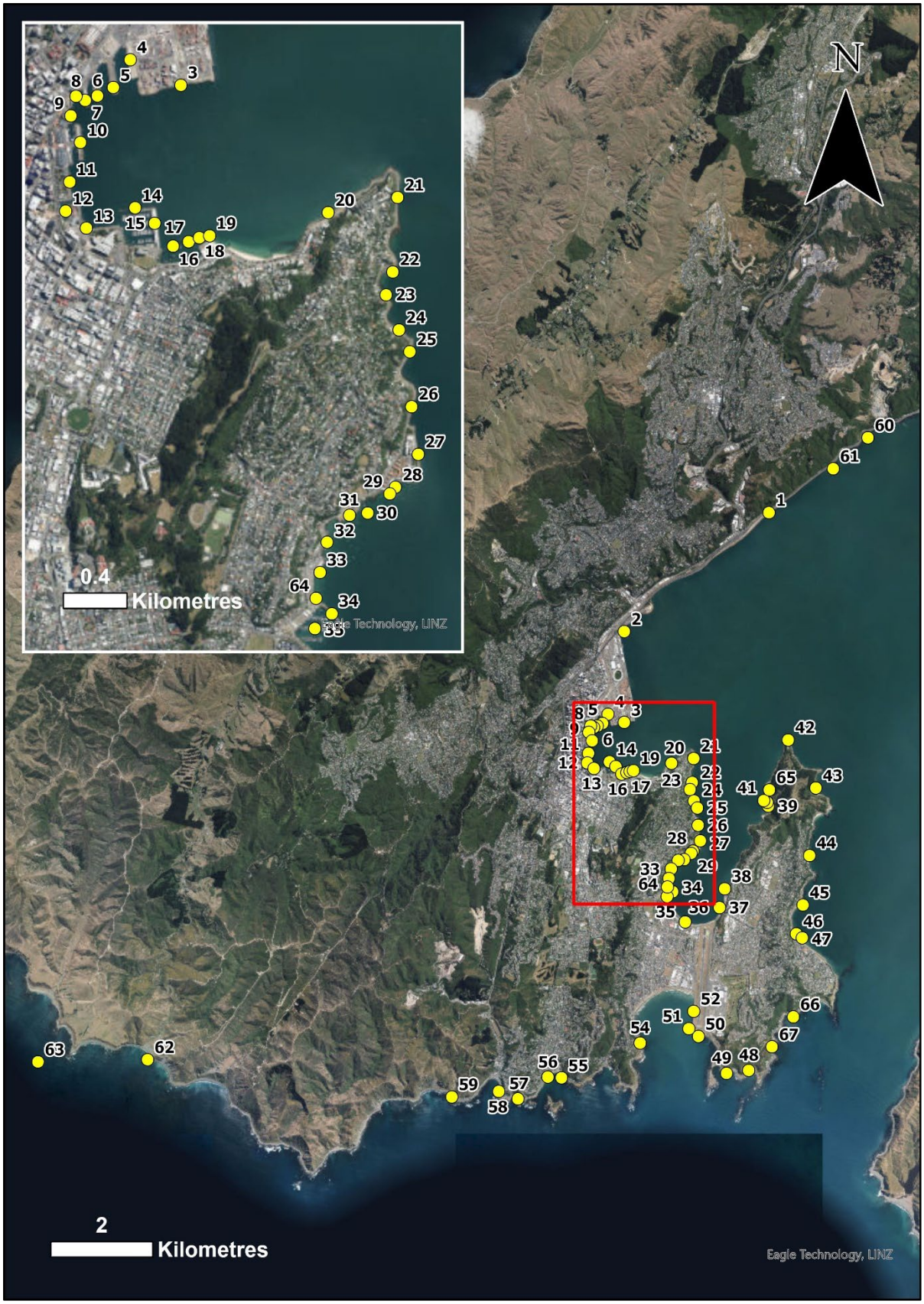

Figure 3.25: Locations of 67 built structures on the Pōneke / Wellington City foreshore included in this survey. Numbers on the map correspond with those listed in Table 3.3.1 below.

Table 3.1: A list of 67 built structures present on the Pōneke / Wellington City foreshore, ranked according to the number of native bird species recorded within 100m of each structure. The National and Regional Threat Ranking scores provide indices of the number of Nationally and Regionally Threatened and At Risk bird species that have been recorded within 100m of each structure. Sites with higher scores provide habitat for either a relatively high number of Threatened or At Risk species, and/or species that are at higher risk of national or regional extinction. The numbering of sites in the table correspond to the numbers that appear on the map in Figure 3.3.1 above.

Structure number	Structure name	No. Native bird species	National Threat Ranking Score	Regional Threat Ranking Score	Rank
1	Petone to Ngauranga rock riprap	11	23	38	1
13	Taranaki Street Wharf	9	20	34	2
42	Point Halswell Lighthouse	9	19	36	3
10	Queens Wharf	9	19	32	4
12	Whairepo Lagoon	9	15	28	5
20	Oriental Bay seawall	7	17	29	6
35	Evans Bay Marina	7	14	21	7
11	Frank Kitts Park rock riprap	7	13	22	8
36	Cobham Drive Rock riprap	7	13	13	9
2	Interislander Wellington Terminal	7	12	21	10
48	Moa Point boat ramp	6	12	20	11
55	Island Bay Marine Education Centre	6	12	18	12
9	Commonwealth Walkway	6	11	13	13
53	Lyall Bay west seawall	5	10	20	14
30	Flying Boat Jetty	5	9	16	15

Structure number	Structure name	No. Native bird species	National Threat Ranking Score	Regional Threat Ranking Score	Rank
43	Mahanga Bay boat ramp and seawall	5	9	15	16
16	Chaffers Marina seawall west	5	8	10	17
29	Greta Point pier	4	10	14	18
39	Shelly Bay derelict wooden jetty	4	9	15	19
45	Worser Bay Boating Club	4	7	11	20
47	Seatoun Wharf	4	6	10	21
21	Point Jerningham seawall	3	9	14	22
44	Karaka Bay jetty	3	7	10	23
7	Waterloo Quay Wharf	3	6	10	24
15	Clyde Quay Wharf	3	6	9	25
54	Dorrie Leslie Park boat ramp	3	5	9	26=
18	Freyberg Pool rock riprap	3	5	9	26=
37	Miramar Wharf	3	5	8	28=
46	Seatoun Boat Ramp	3	5	8	28=
57	Victoria University Coastal Ecology Lab seawall	3	5	8	28=
38	Burnham Wharf	3	5	6	31
58	Owhiro Bay Boat ramp	2	6	9	32
22	Balaena Bay carpark rock riprap	2	6	8	33=
8	Ferry Wharf	2	6	8	33=
49	Moa Point sewer outfall	2	5	9	35

Structure number	Structure name	No. Native bird species	National Threat Ranking Score	Regional Threat Ranking Score	Rank
3	Centreport	2	5	6	36
67	Breaker Bay rock riprap south	2	4	7	37=
24	Weka Bay seawall	2	4	7	37=
14	Clyde Quay seawall	2	4	6	39=
5	Glasgow Wharf	2	4	6	39=
23	Balaena Bay seawall	2	4	3	41
33	Evans Bay Yacht and Motorboat Club	2	3	5	42=
59	Red rocks carpark rock riprap	2	3	5	42=
19	Oriental Bay Beach western promenade	2	3	4	44=
52	Wellington Airport rock riprap (west)	2	3	4	44=
56	Island Bay stormwater outfall	1	4	5	46=
41	Shelly Bay derelict wharf (west)	1	4	5	46=
27	Greta Point rock riprap	1	3	5	48
50	Wellington Airport rock riprap (south)	1	2	4	49=
51	Wellington Airport seawall	1	2	4	49=
66	Breaker Bay rock riprap north	1	2	3	51=
17	Chaffers Marina seawall (east)	1	2	3	51=
62	Karori sewer outfall	1	2	3	51=
31	Cog Park Rock riprap	1	1	1	54=
32	Evans Bay boatsheds	1	1	1	54=

Structure number	Structure name	No. Native bird species	National Threat Ranking Score	Regional Threat Ranking Score	Rank
34	Evans Bay Marina seawall	1	1	1	54=
4	Kings Wharf	1	1	1	54=
25	Kio Bay seawall	1	1	1	54=
64	Evans Bay boat ramp	0	0	0	59=
28	Greta Point boat ramp	0	0	0	59=
26	Greta Point north seawall	0	0	0	59=
63	Karori Rock lighthouse	0	0	0	59=
60	North Uyst	0	0	0	59=
6	Railway Wharf	0	0	0	59=
40	Shelly Bay derelict wharf (east)	0	0	0	59=
65	Shelly Bay seawall	0	0	0	59=
61	South Uyst	0	0	0	59=

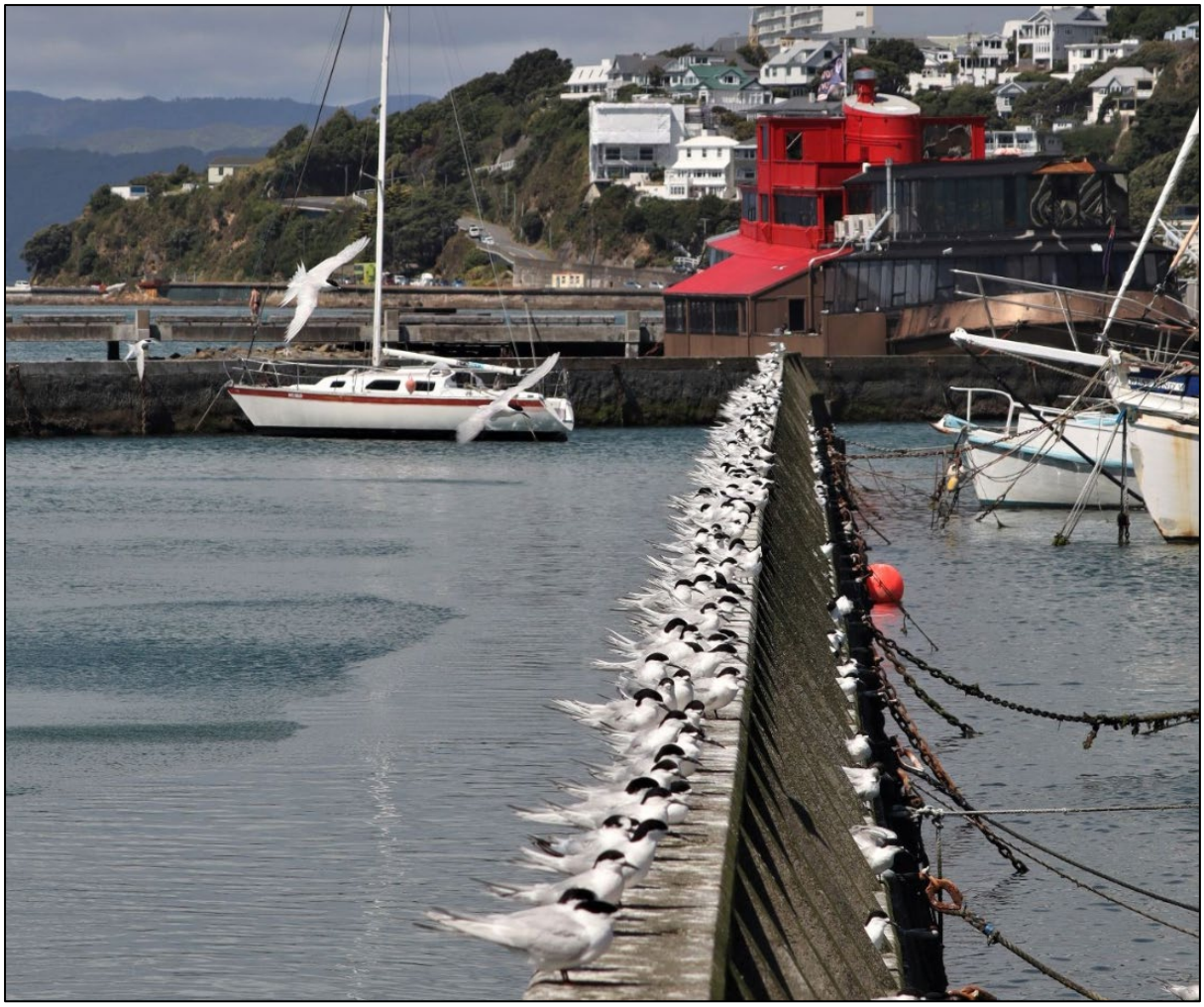

Figure 3.26: Part of a flock of over 400 tara / white-fronted terns roositing on one of the seawalls at Chaffers Marina on the 15th of January 2025 (Image credit: Michael Szabo / Birding NZ.net).

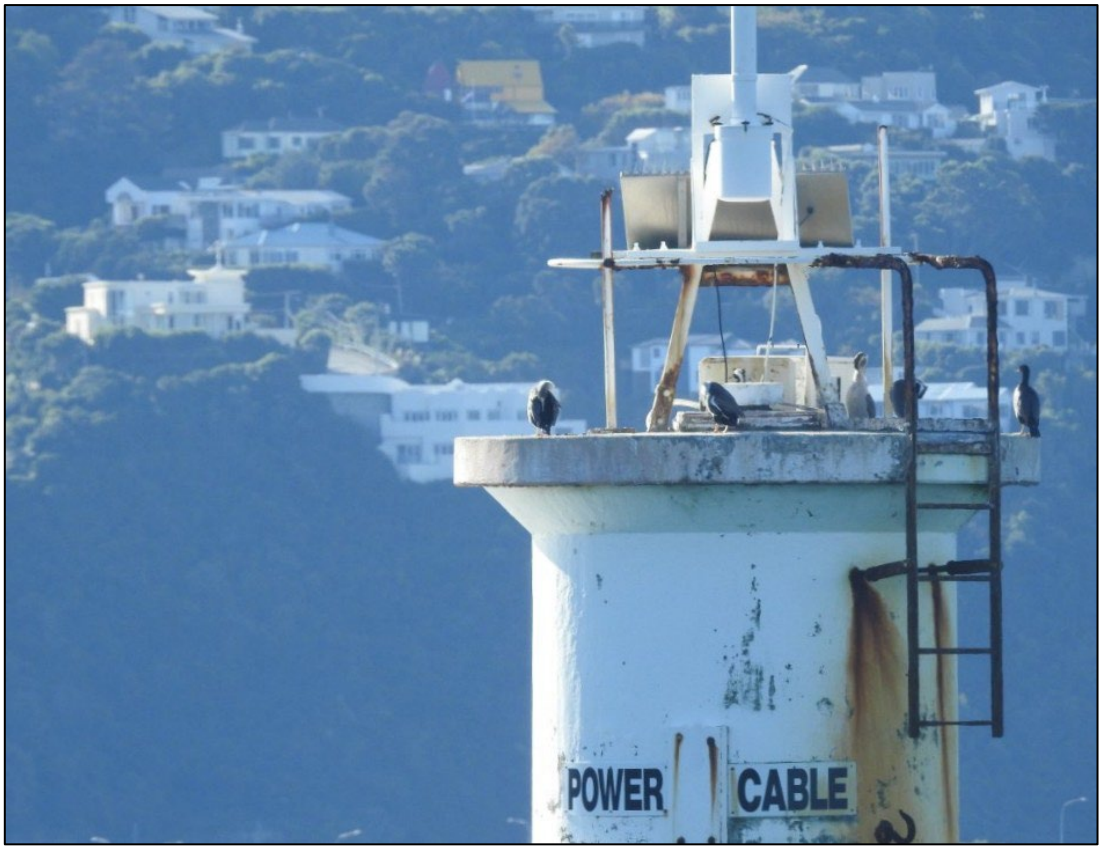

Figure 3.27: Kawau tikitiki / spotted shags roosting on the Point Jerningham light on the 25th of April 2018 (Image credit: Joe Dillon / Macaulay Library ML173538291).

Figure 3.28: A flock of kawau tūī / little black shags roosting on a derelict jetty in Shelly Bay on Te Motu Kairangi / Miramar Peninsula on the 7th of May 2016. This jetty has since been dismantled and removed (Image credit: George Hobson / Macaulay Libarary ML28296571).

4. Discussion

4.1 Spatial patterns in the diversity and abundance of coastal birds along the Pōneke / Wellington coastline

The seven annual bird surveys carried out along the Pōneke / Wellington City coastline between 2018 and 2024 have identified four stretches of coastline that play particularly significant roles in maintaining indigenous coastal bird values within Pōneke / Wellington City. The cliffs and rock stacks on the Oruaiti Reserve foreshore on Te Motu Kairangi / Miramar Peninsula support the only nesting colony of kawau tikitiki / spotted shags to be found along the mainland coastline in the Wellington region, as well as the only nesting colonies of both tarāpunga / red-billed gulls and tara / white-fronted terns currently found along the mainland coastline within Pōneke / Wellington City. Taputeranga Island in Island Bay is one of only four known[3] breeding sites for matuku moana / reef herons in the Wellington region and supports an estimated 20% of the regional breeding population of what is now one of the Wellington region's rarest breeding bird species. Rock platform habitat on the adjacent mainland coast likely provides important feeding habitat for these locally-breeding birds. The island also provides nesting habitat for tarāpunga / red-billed gulls and tōrea pango / variable oystercatchers. The Wellington south coast between Oteranga Bay and Te Rimurapa / Sinclair Head provides habitat for the majority of pohowera / banded dotterels breeding in Pōneke / Wellington City, representing 8% of the total number of pohowera / banded dotterels known to breed along the Wellington region coastline. This stretch of coastline also supports the majority of pīhoihoi / New Zealand pipits to be found within the survey area and represents an estimated 13% of the total number of pīhoihoi / New Zealand pipits that occur along the Wellington region coastline. The foreshore at the southern end of the Wellington International Airport runway and a small area of *Sarcocornia* herbfield and bare gravels adjacent to the runway itself supports a small breeding population of pohowera / banded dotterels and is the only location on the Pōneke / Wellington City coastline east of Te Rimurapa / Sinclair Head where these birds currently breed.

Three of these sites (the Oruaiti Reserve foreshore, Taputeranga Island and the southern end of Wellington International Airport) are included within significant habitats for indigenous birds listed in Schedule F2(c) of Wellington's Proposed Natural Resources Plan (GWRC 2015). The Wellington south coast between Oteranga Bay and Te Rimurapa / Sinclair Head is not currently included within an existing scheduled Significant Indigenous Bird Habitat, although part of this stretch of coastline is included in a proposed "Tongue Point" significant indigenous bird habitat that has been recommended for inclusion in Schedule F2(c) of Wellington's Natural Resources Plan (McArthur 2020b). This latter section of the Pōneke / Wellington City coastline is currently very popular with off-road vehicle enthusiasts, fishers and divers, and the use of off-road vehicles along the Wellington south coast is causing substantial amounts of disturbance to ground-nesting species, including pohowera / banded dotterels, tōrea pango / variable oystercatchers and pīhoihoi / New Zealand pipits (Nikki McArthur personal observation).

[3] Matuku moana / reef herons have been observed nesting on Taputeranga Island, Matiu/Somes Island, Makaro/Ward Island and Mana Island within the past 10 years. The presence of reef herons in the vicinity of Castlepoint suggests they may also be breeding on the north Wairarapa coastline (McArthur *et al.* 2019).

A common feature of all four of these high-value coastal bird habitats is the relatively low rates of human disturbance that occur at these sites. All four sites are relatively inaccessible to people, due to steep terrain, distance from the nearest road and both natural and artificial barriers to access. This common feature strongly suggests that the high rates of human disturbance to much of Pōneke / Wellington City's coastline is likely to be limiting the local diversity and abundance of coastal birds. This in turn suggests that the careful management of human activities along Pōneke / Wellington City coastline is crucial to maintaining the diversity and abundance of indigenous coastal birds in the city. Specifically, it will be important for WCC and GWRC to work together with the local community to minimise rates of human disturbance occurring within the four high-value habitats for coastal birds identified by this survey, as a matter of priority. Management actions could include:

- Investigating options to reduce rates of disturbance caused to ground-nesting coastal birds caused by off-road vehicles on the Wellington south coast between Sinclair Head and Oteranga Bay. Options could include installing signage and barrier fencing to protect key nesting areas and establishing a single agreed-upon vehicle access track along the coastline. Such measures will likely need to be implemented with the close involvement of recreational users of the Wellington south coast, to ensure such measures to be effective.
- Engaging with DOC and Ngāti Toa Rangatira to ensure that the ecological restoration activities being carried out on Taputeranga Island are carried out in a way that avoids disturbance to nesting matuku moana / reef herons, tarāpunga / red-billed gulls and tōrea pango / variable oystercatchers on the island.
- Engaging with DOC and Ngāti Toa Rangatira to discuss the possibility of prohibiting the general public from landing on Taputeranga Island unless they have a permit to do so.
- Installing barrier fencing and warning signage at public access points to the cliffs and rock stacks on the Oruaiti Reserve Foreshore

Another priority for managing the impacts of human disturbance on the indigenous coastal birds of the Pōneke / Wellington City coastline will be to look for opportunities to eliminate or substantially reduce rates of human disturbance at additional 'pocket' habitats along the coastline, to provide additional disturbance-free foraging, roosting and nesting habitat for indigenous coastal birds along the Pōneke / Wellington City coastline. Such measures will require achieving a careful trade-off by creating disturbance-free 'pocket' habitats without restricting public access to sections of coastline that have high recreational or public access values. One excellent example of the creation of 'pocket' habitats that achieve such a trade-off is the recent construction of two small rock rip-rap islands along the foreshore between Petone to Ngauranga to provide additional disturbance-free roosting habitat for coastal birds as mitigation for the development of a new cycleway along this section of the harbour.

The results of these surveys indicate that sections of shoreline that have been 'hardened' in the past by land reclamation or the construction of seawalls support a lower diversity of native coastal bird species, and lower densities of shags and variable oystercatchers. This is likely due to the construction of these structures causing a reduction in the extent of intertidal foraging habitats for these species, a reduction or elimination of high tide roost sites, and increased levels of human disturbance. Such 'hardening' of the Pōneke / Wellington City coastline is likely to continue in future, as part of urban development projects such as the proposed Te Ara Tupua shared pathway between Ngauranga and Petone, and to reduce the risk of coastal flooding associated with future sea-level rise. To prevent further losses of indigenous species diversity and abundance associated with future shoreline "hardening" projects, these future projects should aim to avoid any net loss in intertidal habitat and

should include the construction of structures designed to provide disturbance-free high tide roosts for the indigenous coastal bird species known to be present along the affected section of coastline.

Twenty of the 51 bird species recorded during these bird surveys (39%) are currently ranked as either Nationally Threatened or At Risk under the New Zealand Threat Classification System (Robertson *et al.* 2021), and eleven of these twenty species (58%) have been assigned the new "Climate Impacts" qualifier recently added to the New Zealand Threat Classification System by Rolfe *et al.* (2021). This new qualifier is designed to identify taxa that are, or are predicted to be, adversely affected by long-term climate trends and/or extreme climatic events, including extended periods of abnormal rainfall or sunshine hours, short-duration extreme weather events, and gradual changes to sea level and average temperatures. The assignment of the Climate Impact qualifier to a taxon indicates a need for more in-depth research, ongoing monitoring of climate impacts, and potentially a climate change adaptation plan for the taxon (Rolfe *et al.* 2021). The fact that 58% of the Nationally Threatened and At Risk bird taxa detected during this survey have been assigned this qualifier highlights the high degree of vulnerability that many of Pōneke / Wellington City's coastal bird species have to the impacts of human-induced climate change. Recent modelling of both sea-level rise and vertical land movement data has shown that rates of sea level rise along the Pōneke / Wellington City coastline may be twice as high as previously thought. The sea level along parts of the Pōneke / Wellington City coastline is now predicted to rise by 30 cm within the next 10-20 years, and up to 1 metre over the next century, assuming that Paris Agreement goals are met[4]. The potential effects of this sea level rise on Pōneke / Wellington City's coastal birds will likely include reductions of breeding, foraging and roosting habitats and increasing losses of eggs and chicks due to flooding, the combined effects of which have the potential to be sufficiently severe to negate any efforts that have been made in the meantime to reduce the adverse impacts of other threats such as mammalian predators, weeds, recreational activities and land-use changes. This in turn highlights the urgent need for both Wellington City Council and Greater Wellington Regional Council to include consideration of climate change impacts on indigenous coastal bird species into all aspects of the future management of the Pōneke / Wellington City coastline and its bird values.

These coastal bird surveys have succeeded in creating a detailed and up-to-date picture of the diversity, abundance and distribution of indigenous birds along the Pōneke / Wellington City coastline. It is recommended that these surveys be continued on an annual basis, so that trends in both the population size and distribution of indigenous coastal birds can continue to be quantified.

4.2 Assessing the habitat value of built structures in the coastal marine area

The assessment of the habitat values of built structures on the Pōneke / Wellington City foreshore for included in this report has demonstrated that indigenous coastal birds, including both Nationally and Regionally Threatened and At Risk species, frequently occur on, and within 100m, of built structures. Coastal bird species utilize stretches of rock rip-rap, seawalls, wharves, jetties, lighthouses and marinas as roosting, feeding and breeding habitat, and structures within the inner harbour may provide particularly important habitats for coastal birds considering the highly modified nature of the inner harbour coastline.

[4] https://www.searise.nz/maps-2; accessed 08/06/2022.

Citizen science data is proving useful for providing bird observation data that can be used to rank coastal structures according to the diversity and threat status of the bird species utilizing these structures, however it appears that these rankings are biased by the relative accessibility of each structure, which in turn determines how much observation effort is accumulated by local citizen scientists. As a result, many of those structures with higher levels of public access and recreational use tend to have comparatively high rankings, whereas those structures with little or no public access tend to have comparatively low rankings. That said, this bias is beginning to be diluted by the collection of more systematic bird occurrence data for the 67 structures identified in this report. Over the next few years, the annual, systematic surveys of these structures irrespective of their relative accessibility should improve the accuracy of these habitat value rankings, providing an increasingly reliable picture of the relative contribution that each structure makes towards maintaining the distribution and abundance if indigenous coastal birds in Pōneke / Wellington City.

Despite the fact that citizen science observation effort tends to be biased towards more accessible structures, the results contained in this report indicate that it is those structures that are less accessible, or inaccessible to the general public that provide the most valuable roosting habitat for indigenous coastal birds, presumably due to the fact that these birds are seldom disturbed or displaced by human activities. Coastal structures that are inaccessible to the general public tend to fall into two broad categories. The first category includes those structures that are currently in use, but are physically difficult or unsafe to access, for example the Chaffer's Marina seawall and the Point Halswell Light. The second category includes those structures that are no longer in use and have fallen into disrepair, and which the public are prohibited from accessing. A number of these latter category of structures, such as the derelict jetty at Greta Point (an important winter roost for tara / white-fronted terns) and the derelict wharves and jetties in Shelly Bay (important roosting habitat for matuku moana / reef herons, tōrea pango / variable oystercatchers and tarāpunga / red-billed gulls) have recently been dismantled, leading to a net loss of high-quality, low-disturbance roosting habitat for coastal indigenous birds in Evans Bay. To prevent similar net losses in low-disturbance roosting habitats along the Pōneke / Wellington City coastline in the future, it is recommended that WCC and GWRC engages with resource consent applicants and the local community to negotiate agreed-upon resource consent conditions requiring the creation of new low-disturbance roosting habitats to offset the loss of habitat caused by the dismantling and removal of derelict structures.

5. Recommendations

Based on the results described in this report, we suggest that Wellington City Council considers adopting the following recommendations:

- That this coastal bird monitoring programme be continued on an annual basis, to provide a consistent, repeatable measure of the state and trends in the diversity, distribution and abundance of coastal birds along the Pōneke / Wellington City coastline, in order to contribute towards objective 4.2.2a of WCC's Biodiversity Strategy and Action Plan (WCC, 2015).

- That the section of coastline between Ngauranga and the Wellington Railway station be surveyed by boat from the 2024-2025 summer season onwards. This section of the coastline has not been surveyed between 2018 and 2023 due to a lack of public access and the presence of a commercial port, however it does include significant habitats, including the Kaiwharawhara Stream mouth, and a number of significant built structures (the Wellington Interislander ferry terminal and Centreport), so a boat survey of this section of the coastline would fill a significant gap in current survey coverage.

- That WCC and GWRC prioritise working with the local community to minimise rates of human disturbance occurring within the four high-value habitats for coastal birds identified by this survey, as a matter of priority. Management actions could include:

    - Investigating options to reduce rates of disturbance caused to ground-nesting coastal birds caused by off-road vehicles on the Wellington south coast between Sinclair Head and Oteranga Bay.

    - Engaging with DOC and Ngāti Toa Rangatira to ensure that the ecological restoration activities being carried out on Taputeranga Island are carried out in a way that avoids disturbance to nesting matuku moana / reef herons, tarāpunga / red-billed gulls and tōrea pango / variable oystercatchers

    - Engaging with DOC and Ngāti Toa Rangatira to discuss the possibility of prohibiting the general public from landing on Taputeranga Island unless they have a permit to do so.

    - Installing barrier fencing and warning signage at public access points to the cliffs and rock stacks on the Oruaiti Reserve Foreshore

- That WCC and GWRC actively engages with resource consent applicants and the local community to negotiate agreed-upon resource consent conditions requiring the creation of new low-disturbance roosting habitats to offset any habitat loss caused by the dismantling and removal of derelict structures situated in the Pōneke / Wellington City coastal marine area.

Acknowledgements

This project was initiated by Daniela Biaggio, Urban Ecology Manager at Wellington City Council, and by Roger Uys, Senior Terrestrial Ecologist, Greater Wellington Regional Council. Roger Uys assisted with administration and project logistics and Samantha Ray, Jonathan Walter, Hayley Ricardo, Joanna McVeagh, Colin Shore and Dianne John all assisted with the fieldwork. Guy Parkinson kindly provided permission to access the Wellington south coast via Terawhiti Station and Rebecca Lunt and Roger Uys provided useful comments and corrections to an earlier version of this report.

References

Bell, M. 2013. *Pied shag population review*. Client report prepared for the Department of Conservation. Wildlife Management International Ltd, Blenheim.

Bell, E.A. 2017. *Monitoring of the black-backed gull in the Wellington area: 2016/17 Season: Action and recommendations.* Client report prepared for Wellington International Airport Ltd. Wildlife Management International Ltd, Blenheim.

Burgin, D. and Ray, S. 2020. *2019 Operational report on Petone Beach to Oteronga Bay, Wellington coastal bird survey*. Client report prepared for Greater Wellington Regional Council, Wildlife Management International Ltd, Blenheim.

Checklist Committee (C.M. Miskelly, Convener). 2024. *Checklist of the Birds of New Zealand* (Sixth edition). Ornithological Society of New Zealand, Wellington. https://www.birdsnz.org.nz/society-publications/checklist/)

Crisp, P.; Robertson, H.; McArthur, N.; and Cotter, S. 2024. *Conservation status of birds in the Wellington Region, 2023.* Publication No. GW/KI-G-23/21, Greater Wellington Regional Council, Wellington.

Department of Conservation, 2010. *New Zealand Coastal Policy Statement 2010.* Department of Conservation, Wellington.

eBird, 2025. eBird: An online database of bird distribution and abundance [web application]. eBird, Ithaca, New York. Available: http://www.eBird.org. (Accessed: 25/05/2025).

Edgar, A.T. 1978. The reef heron (*Egretta sacra*) in New Zealand. *Notornis* 25: 25-53.

Greater Wellington Regional Council. 2015. *Proposed Natural Resources Plan for the Wellington Region – Te Tikanga Taiao o Te Upoko o Te Ika a Maui*. Publication No. GW/EP-G-15/44, Greater Wellington Regional Council, Wellington.

Heather, B.D. and Robertson, H.A. 2015. *The field guide to the birds of New Zealand,* (4th edition). Penguin, Auckland.

Hodge, 2020. eBird Checklist: https://ebird.org/atlasnz/checklist/S72236585. eBird: An online database of bird distribution and abundance [web application]. eBird, Ithaca, New York. Available: https://ebird.org/newzealand/home (Accessed: 03/06/2021).

McArthur, N. 2020a. *A review of the status and management of banded dotterels (*Charadrius bicinctus*) on Ōnoke Spit*. Client report prepared for the Department of Conservation, Masterton.

McArthur, N. 2020b. *A review of significant coastal and freshwater habitats for indigenous birds in the Wellington region*. Client report prepared for Greater Wellington Regional Council, Wellington.

McArthur, N. 2022. *State and trends in the indigenous bird values of the Wellington City coastline*. Client report prepared for Greater Wellington Regional Council, Wellington.

McArthur, N. 2023. *State and trends in the indigenous bird values of the Wellington City coastline*. Client report prepared for Greater Wellington Regional Council, Wellington.

McArthur, N. 2024. *State and trends in the indigenous bird values of the Wellington City coastline.* Client report prepared for Greater Wellington Regional Council, Wellington.

McArthur, N. 2025. *State and trends in the diversity, abundance and distribution of coastal birds in the Wellington region.* Client report prepared for Greater Wellington Regional Council, Wellington.

McArthur, N.; Jones, P. and Lees, D. 2021b. *Eastbourne - Wainuiomata coastline tūturiwhatu / banded dotterel management strategy 2021-2026*. Unpublished report, Mainland Island Restoration Organisation, Eastbourne.

McArthur, N. and Lawson, J. 2013. *Coastal and freshwater sites of significance for indigenous birds in the Wellington region*. Publication No. GW/ESCI-T-14/67, Greater Wellington Regional Council, Wellington.

McArthur, N.; McVeagh, J.; Shore, C. and John, D. 2021a. *State and trends in the indigenous bird values of the Wellington City coastline.* Client report prepared for Greater Wellington Regional Council, Wellington.

McArthur, N.; Ray, S.; Crowe, P. and Bell, M. 2019. *A baseline survey of the indigenous bird values of the Wellington region coastline*. Client report prepared for Greater Wellington Regional Council, Wildlife Management International Ltd, Blenheim.

McArthur, N.; Robertson, H.; Adams, L.; and Small, D. 2015. *A review of coastal and freshwater habitats of significance for indigenous birds in the Wellington region*. Publication No. GW/ESCI-T-14/68, Greater Wellington Regional Council, Wellington.

Powlesland, R.G.; Sharp, S.E. and Smith, A.N.H. 2008. Aspects of the breeding biology of the pied shag (*Phalacrocorax varius*) at Makara Beach, Wellington, New Zealand. *Notornis* 55: 69-76.

Robertson, H.A. 1992. Trends in the numbers and distribution of coastal birds in Wellington Harbour. *Notornis* 39: 263-289.

Robertson, H.A.; Baird, K.A.; Elliott, G.P.; Hitchmough, R.A.; McArthur, N.J.; Makan, T.D.; Miskelly, C.M.; O'Donnell, C.J.F.; Sagar, P.M.; Scofield, R.P.; Taylor, G.A. and Michel, P. 2021. Conservation status of New Zealand birds, 2021. New Zealand Threat Classification Series 36, Department of Conservation, Wellington.

Rolfe, J.; Makan, T; Tait, A. 2021: *Supplement to the New Zealand Threat Classification System manual 2008: new qualifiers and amendments to qualifier definitions, 2021*. Department of Conservation, Wellington.

Scofield, R.P.; Christie, D.; Sagar, P.M. and Sullivan, B.L. 2012. eBird and avifaunal monitoring by the Ornithological Society of New Zealand. *New Zealand Journal of Ecology* 36: 279-286.

Sullivan, B.L.; Aycrigg, J.L.; Barry, J.H.; Bonney, R.E.; Bruns, N.; Cooper, C.B.; Damoulas, T.; Dhondt, A.A.; Dietterich, T.; Farnsworth, A.; Fink, D.; Fitzpatrick, J.W.; Fredericks, T.; Gerbracht, J.; Gomes, C.; Hochachka, W.M.; Iliff, M.J.; Lagoze, C.; La Sorte, F.; Merrifield M.; Morris, W.; Phillips, T.B.; Reynolds, M.; Rodewald, A.D.; Rosenberg, K.V.; Trautmann, N.M.; Wiggins, A.; Winkler, D.W.; Wong, W.-K.; Wood, C.L.; Yu, J. and Kelling, S. 2014. The eBird enterprise: An integrated approach to development and application of citizen science. *Biological Conservation* 169: 31-40.

Waugh, S.; Tennyson, A.; Orange, R.; Sharp, S.; Cotter, R.; Batcheler, R. and Batcheler, D. 2013. Numbers of spotted shags (*Stictocarbo punctatus*) at breeding sites in Te Whanganui-a-tara / Wellington Harbour, 2002-2012. *Notornis* 60: 285-289.

Wellington City Council, 2015. *Our natural capital – Wellington's biodiversity strategy and action plan 2015*. Wellington City Council, Wellington.

Appendix One

This appendix contains a list of the 1 kilometre survey sections boundaries used to subdivide the 55 km of coastline surveyed each year between 2018 and 2024 as part of the Pōneke / Wellington City coastal bird survey. The locations of each waypoint area expressed as New Zealand Transverse Mercator coordinates.

Waypoint number	Easting	Northing	Waypoint number	Easting	Northing
277	1755651	5434548	314	1751280	5422284
278	1754723	5434209	315	1751035	5423020
279	1753917	5433629	316	1750250	5422960
280	1753146	5432993	317	1750068	5422191
281	1752374	5432357	318	1749963	5421362
290	1749210	5427544	319	1749440	5421625
291	1749718	5427429	323	1748854	5421625
292	1750624	5427560	324	1748041	5421260
293	1751010	5427480	325	1747217	5421134
294	1751175	5426531	326	1746689	5421035
295	1750788	5425784	327	1745760	5421122
296	1750503	5425067	328	1744895	5420856
297	1751105	5424516	329	1744318	5420086
298	1751633	5424952	330	1743519	5419621
299	1752022	5425854	331	1742785	5420169
300	1752423	5426643	332	1742141	5420804
301	1752497	5427297	333	1741440	5421340
302	1752955	5428052	334	1740663	5421686
303	1753546	5427427	335	1739802	5422120
304	1753593	5426668	336	1738857	5421959
305	1753362	5425766	337	1738572	5422711
306	1753183	5424880	338	1737980	5423389
307	1753328	5424098	339	1737430	5424007
308	1753892	5423305	341	1736762	5424751
309	1753326	5422968	342	1736522	5425660
310	1752653	5422368	343	1736501	5426568
311	1752411	5421470	344	1736139	5427232
312	1751720	5421602			

Appendix Two

This appendix contains a list of all the bird species encountered during the Pōneke / Wellington City coastal bird surveys carried out between 2018 and 2024 (P = species detected). Scientific names, common names (both Māori and English) and taxonomic order have been sourced from the *Checklist of the birds of New Zealand* (Checklist Committee, 2024). The national conservation status rankings used are those New Zealand Threat Classification System rankings listed in Robertson *et al.* (2021) and the regional conservation status rankings are those listed in Crisp *et al.* (2024).

Māori name	Common name	Scientific name	National threat ranking	Regional threat ranking	2018	2019	2020	2021	2022	2023	2024
kakīānau	black swan	*Cygnus atratus*	Not Threatened	Not Threatened						P	
kuihi	Canada goose	*Branta canadensis*	Introduced and Naturalised	Introduced and Naturalised	P						
pūtangitangi	paradise shelduck	*Tadorna variegata*	Not Threatened	Not Threatened	P	P	P		P	P	P
rakiraki	mallard	*Anas platyrhynchos*	Introduced and Naturalised	Introduced and Naturalised	P	P	P	P	P	P	P
Tikaokao	California quail	*Callipepla californica*	Introduced and Naturalised	Introduced and Naturalised					P		P
kererū aropari	rock pigeon	*Columba livia*	Introduced and Naturalised	Introduced and Naturalised	P	P	P	P	P	P	P
kererū	New Zealand pigeon	*Hemiphaga novaeseelandiae*	Not Threatened	Not Threatened				P			

Māori name	Common name	Scientific name	National threat ranking	Regional threat ranking	2018	2019	2020	2021	2022	2023	2024
pīpīwharauroa	shining cuckoo	*Chrysococcyx lucidus*	Not Threatened	Not Threatened				P			
tōrea pango	variable oystercatcher	*Haematopus unicolor*	At Risk, Recovering	Regionally Endangered	P	P	P	P	P	P	P
tōrea	South Island pied oystercatcher	*Haematopus finschi*	At Risk, Declining	Migrant			P		P		
poaka	pied stilt	*Himantopus himantopus*	Not Threatened	Not Threatened		P	P	P	P	P	P
	spur-winged plover	*Vanellus miles*	Not Threatened	Not Threatened	P	P	P	P	P	P	P
pohowera	banded dotterel	*Anarhynchus bicinctus*	At Risk, Declining	Regionally Endangered	P	P	P	P	P	P	P
tarāpunga	red-billed gull	*Chroicocephalus novaehollandiae*	At Risk, Declining	Regionally Vulnerable	P	P	P	P	P	P	P
tarāpuka	black-billed gull	*Chroicocephalus bulleri*	At Risk, Declining	Regionally Critical			P				
karoro	southern black-backed gull	*Larus dominicanus*	Not Threatened	Not Threatened	P	P	P	P	P	P	P
taranui	Caspian tern	*Hydroprogne caspia*	Nationally Vulnerable	Regionally Critical			P		P		
tara	white-fronted tern	*Sterna striata*	At Risk, Declining	Regionally Endangered	P	P	P	P	P	P	P
kororā	little penguin	*Eudyptula minor*	At Risk, Declining	Regionally Vulnerable	P	P		P			
toroa	white-capped albatross	*Thalassarche cauta*	At Risk, Declining	Migrant				P	P		
pāngurunguru	northern giant petrel	*Macronectes halli*	At Risk, Recovering	Migrant		P			P		

Māori name	Common name	Scientific name	National threat ranking	Regional threat ranking	2018	2019	2020	2021	2022	2023	2024
pakahā	fluttering shearwater	*Puffinus gavia*	At Risk, Relict	Regionally Critical		P	P	P	P	P	P
tākapu	Australasian gannet	*Morus serrator*	Not Threatened	Migrant	P	P	P	P	P	P	P
kawaupaka	little shag	*Microcarbo melanoleucos*	At Risk, Relict	Regionally Endangered	P	P	P	P	P	P	P
māpunga	black shag	*Phalacrocorax carbo*	At Risk, Relict	Regionally Critical	P	P	P	P	P	P	P
kāruhiruhi	pied shag	*Phalacrocorax varius*	At Risk, Recovering	Regionally Vulnerable	P	P	P	P	P	P	P
kawau tūī	little black shag	*Phalacrocorax sulcirostris*	At Risk, Naturally Uncommon	Regionally Endangered			P	P	P		
kawau tikitiki	spotted shag	*Phalacrocorax punctatus*	Nationally Vulnerable	Regionally Critical	P	P	P	P	P	P	P
matuku moana	white-faced heron	*Egretta novaehollandiae*	Not Threatened	Not Threatened	P	P	P	P	P	P	P
matuku moana	reef heron	*Egretta sacra*	Nationally Endangered	Regionally Critical	P	P	P	P	P	P	P
kōtuku ngutupapa	royal spoonbill	*Platalea regia*	At Risk, Naturally Uncommon	Regionally Endangered					P		
kāhu	swamp harrier	*Circus approximans*	Not Threatened	Not Threatened		P			P	P	
kōtare	New Zealand kingfisher	*Todiramphus sanctus*	Not Threatened	Not Threatened				P		P	P
kārearea	New Zealand falcon	*Falco novaeseelandiae*	Nationally Increasing	Regionally Critical	P				P		
tūī	tūī	*Prosthemadera novaeseelandiae*	Not Threatened	Not Threatened	P	P	P	P	P	P	P

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riroriro	grey warbler	*Gerygone igata*	Not Threatened	Not Threatened		P	P	P	P	P	P
makipai	Australian magpie	*Gymnorhina tibicen*	Introduced and Naturalised	Introduced and Naturalised	P						
pīwakawaka	New Zealand fantail	*Rhipidura fuliginosa*	Not Threatened	Not Threatened		P	P	P	P	P	P
kairaka	Eurasian skylark	*Alauda arvensis*	Introduced and Naturalised	Introduced and Naturalised		P	P	P	P	P	P
warou	welcome swallow	*Hirundo neoxena*	Not Threatened	Not Threatened	P	P	P	P	P	P	P
tauhou	silvereye	*Zosterops lateralis*	Not Threatened	Not Threatened		P	P	P	P	P	P
tāringi	common starling	*Sturnus vulgaris*	Introduced and Naturalised	Introduced and Naturalised	P	P	P	P	P	P	P
manu pango	Eurasian blackbird	*Turdus merula*	Introduced and Naturalised	Introduced and Naturalised	P	P	P	P	P	P	P
manu-kai-hua-rakau	song thrush	*T. philomelos*	Introduced and Naturalised	Introduced and Naturalised		P		P	P	P	P
	dunnock	*Prunella modularis*	Introduced and Naturalised	Introduced and Naturalised	P	P	P	P	P	P	P
tiu	house sparrow	*Passer domesticus*	Introduced and Naturalised	Introduced and Naturalised	P	P	P	P	P	P	P

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pīhoihoi	New Zealand pipit	*Anthus novaeseelandiae*	At Risk, Declining	Regionally Endangered	P	P	P	P	P	P	P
pahirini	chaffinch	*Fringilla coelebs*	Introduced and Naturalised	Introduced and Naturalised	P	P	P	P	P	P	P
	European greenfinch	*Chloris chloris*	Introduced and Naturalised	Introduced and Naturalised	P	P	P	P	P	P	P
kōurarini	European goldfinch	*Carduelis carduelis*	Introduced and Naturalised	Introduced and Naturalised	P	P	P	P	P	P	P
hurukōwhai	yellowhammer	*Emberiza citrinella*	Introduced and Naturalised	Introduced and Naturalised		P	P	P	P	P	P