

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

June 2022



**Author:**  
NIKKI MCARTHUR

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

Nikki McArthur

17A Ida Street, Redwoodtown, Blenheim 7201

This report was prepared for Greater Wellington Regional Council in fulfilment of the Contract for Services dated 12<sup>th</sup> November 2020

10<sup>th</sup> June 2022

### **Citation:**

This report should be cited as:

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.

All photographs in this report are copyright © N. McArthur unless otherwise credited, in which case the person or organization credited is the copyright holder.

Cover Image: A view of the Wellington south coast looking westwards from Tongue Point towards Outlook Hill.

## Table of Contents

Executive Summary.....	3
1. Introduction .....	4
2. Methods.....	6
2.1 Survey area .....	6
2.2 Field survey methods.....	6
2.3 Data management and analysis.....	8
3. Results.....	9
3.1 Spatial patterns in species diversity.....	9
3.2 Abundance and distribution of coastal bird species.....	11
3.2.1 Kawaupaka / Little shag ( <i>Microcarbo melanoleucos</i> ) .....	11
3.2.2 Māpunga / Black shag ( <i>Phalacrocorax carbo</i> ).....	13
3.2.3 Kāruhiruhi / Pied shag ( <i>Phalacrocorax varius</i> ).....	15
3.2.4 Kawau tūi / Little black shag ( <i>Phalacrocorax sulcirostris</i> ).....	17
3.2.5 Kawau tikitiki / Spotted shag ( <i>Phalacrocorax punctatus</i> ) .....	19
3.2.6 Matuku moana / Reef heron ( <i>Egretta sacra</i> ).....	21
3.2.7 Tōrea pango / Variable oystercatcher ( <i>Haematopus unicolor</i> ) .....	24
3.2.8 Pohowera / Banded dotterel ( <i>Charadrius bicinctus</i> ) .....	26
3.2.9 Tarāpunga / Red-billed gull ( <i>Chroicocephalus novaehollandiae</i> ).....	28
3.2.10 Tara / White-fronted tern ( <i>Sterna striata</i> ).....	30
3.2.11 Pīhoihoi / New Zealand pipit ( <i>Anthus novaeseelandiae</i> ) .....	32
4. Discussion.....	34
Acknowledgements.....	36
References .....	37
Appendix .....	39

## 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 Wellington City coastline. To discharge these 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 Wellington City coastline and the spatial distribution of those values. To achieve this, WCC and GWRC have collaborated to carry out an annual bird survey along the Wellington City coastline between Oteranga Bay and the western end of Petone Beach each year since 2018.

Forty-eight bird species have been detected during the four annual surveys carried out since 2018, including 34 species (71%) which are native or endemic to New Zealand. Nineteen of these 48 bird species (40%) are ranked as Nationally Threatened or At Risk under the New Zealand Classification System, and 17 species (35%) are ranked as Regionally Threatened or At Risk. Local indigenous species diversity appears to be fairly uniform along the Wellington City coastline, except along sections of shoreline that have been 'hardened' by land reclamation or the construction of seawalls, where it appears to be lower.

Four stretches of the Wellington City coastline play a particularly significant role in maintaining indigenous coastal bird values within Wellington City. Point Dorset on Miramar Peninsula supports the only nesting colonies of kawau tikitiki / spotted shags, tarāpunga / red-billed gulls and tara / white-fronted terns to be found on the mainland Wellington City coastline. Taputeranga Island in Island Bay is one of only four known breeding sites for matuku moana / reef heron 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 most of the pohowera / banded dotterels breeding in Wellington City and supports most of the pīhoihoi / NZ pipits to be found along the 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 Wellington City coastline east of Sinclair Head.

Fifty-eight percent of the Nationally Threatened and At Risk bird species detected during this survey have been assessed as being at risk from the impacts of human-induced climate change. With sea levels along the Wellington City coastline projected to rise by up to 30cm within the next 10-20 years, and 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 Wellington City coastline and its bird values.

It is recommended that this survey be continued on an annual basis, to enable WCC and GWRC to maintain an up-to-date understanding of the population trends and distribution of indigenous coastal birds along the Wellington City coastline.

Keywords: Coastal bird, eBird, Greater Wellington Regional Council, 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 Wellington City, including maintaining the indigenous bird values of the Wellington City 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 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 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 have identified a total of 51 coastal sites that meet these Policy 23 translation criteria and 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 *et al.* 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 Wellington City coastline and the spatial distribution of those values. Existing knowledge of the distribution of indigenous bird values along the Wellington City 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 2020). These surveys have documented substantial seasonal fluctuations in the abundance of a number of mobile coastal 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*), 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 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 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 Wellington City coastline in 2018. The results of these surveys are summarised in McArthur *et al.* (2019). In 2019 and 2020, this survey was repeated along the 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) and McArthur *et al.* (2021). These surveys have recorded the presence of 44 bird species along the Wellington City coastline between Petone Beach and Oteranga Bay, including 30 species (68%) which are native or endemic to New Zealand, 16 species which are ranked as Nationally Threatened or At Risk under the New Zealand Classification System, and 17 species (39%) which are ranked as Regionally Threatened or At Risk. These surveys have also shown that four stretches of the Wellington City coastline play a particularly significant role in maintaining indigenous coastal bird values within Wellington City. Point Dorset on 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 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 most of the pohowera / banded dotterels (*Charadrius bicinctus*) breeding in Wellington City and supports most of the pīhoihoi / NZ pipits (*Anthus novaeseelandiae*) to be found along the 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 Wellington City coastline east of Sinclair Head.

This report summarises the results of a fourth year of surveys carried out along the Wellington City coastline during the summer of 2021-2022, incorporating results from the surveys carried out in 2018, 2019 and 2020.

## 2. Methods

### 2.1 Survey area

An annual bird survey has been carried out along a total of 55 km of the Wellington City coastline, between the western end of Petone Beach and the western end of Oteranga Bay each year between 2018 and 2022 (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. Taputeranga Island was either visited by kayak or surveyed from the adjacent mainland coastline using a 20-60x magnification spotting scope.

### 2.2 Field survey methods

Surveys were carried out between November and January, at a time of year when most coastal-breeding shorebirds were breeding and were 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 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 the 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.



Figure 2.1: Extent of the Wellington City coastline surveyed over four consecutive summers between 2018 and 2022.

## 2.3 Data management and analysis

These survey data were entered into a Microsoft Excel™ spreadsheet which was then used to calculate species count totals and 4-year mean counts for each km 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. Four-year mean counts for key coastal shorebird species were imported into ArcMap version 10.8.2, which was used to prepare the distribution maps contained in this report.

## 3. Results

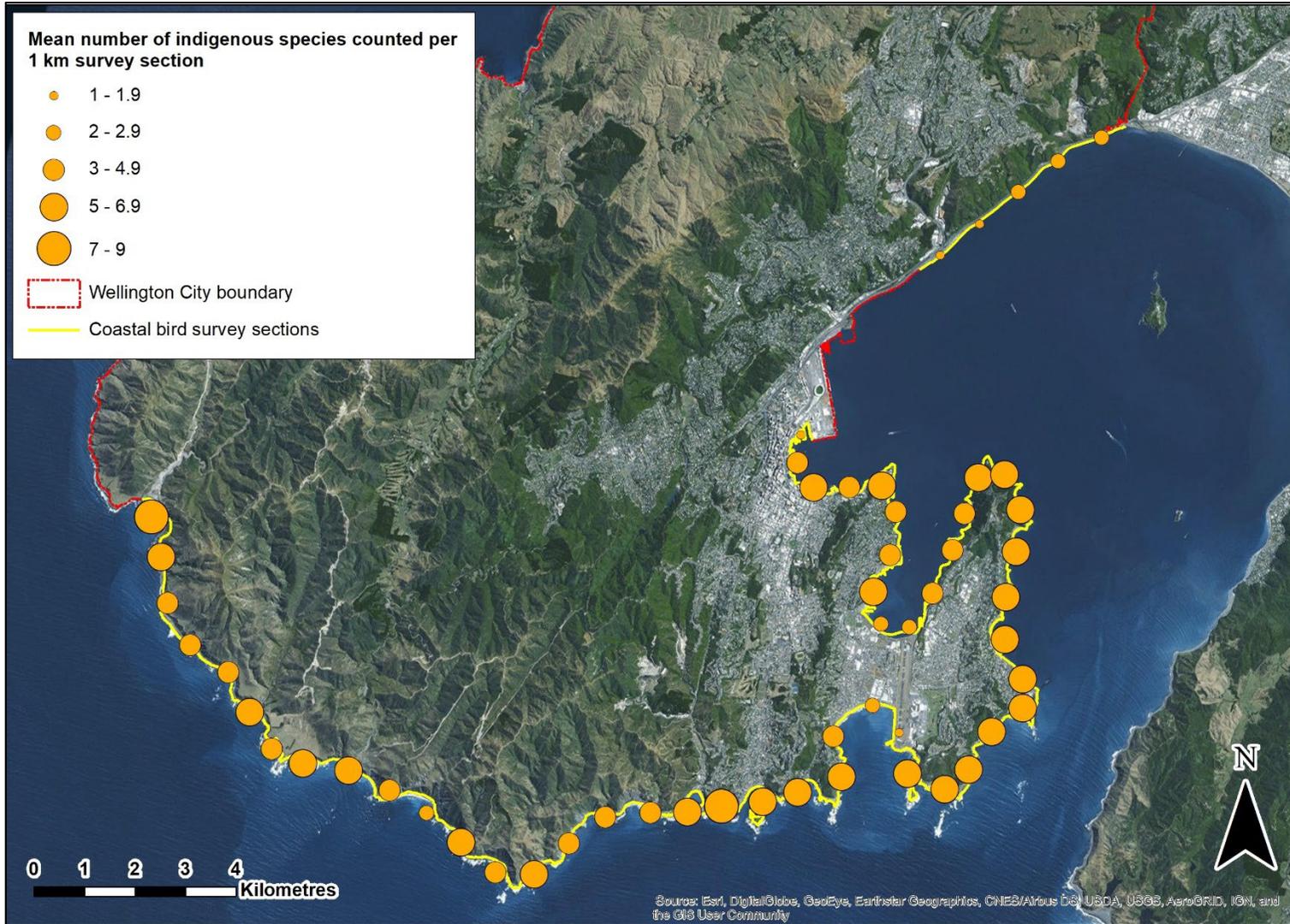
### 3.1 Spatial patterns in species diversity

A total of 48 bird species have been detected during the four annual surveys of the Wellington City coastline carried out between 2018 and 2022. Four species, kererū (*Hemiphaga novaeseelandiae*), kōtare / New Zealand kingfisher (*Todiramphus sanctus*), pīpīwharau / shining cuckoo (*Chrysococcyx lucidus*) and toroa / white-capped albatross (*Thalassarche cauta*) were all recorded for the first time during the 2021/2022 survey. A full list of the 48 bird species recorded can be found in the Appendix of this report. Thirty-four (71%) of the species detected were native to New Zealand and the remaining 14 species (29%) were introduced and naturalised species.

Nineteen (40%) of the bird species detected are ranked as either Nationally Threatened or At Risk under the New Zealand Threat Classification System. These included the following Nationally Threatened species: one species ranked as Nationally Endangered (matuku moana / reef heron); two species ranked as Nationally Vulnerable (taranui / Caspian tern, *Hydroprogne caspia*; kawau tikitiki / spotted shag, *Phalacrocorax punctatus*) and one species ranked as Nationally Increasing (kārearea / New Zealand falcon, *Falco novaeseelandiae*). Two further bird species detected are ranked as At Risk, Recovering; three species are ranked as At Risk, Relict; one species is ranked as At Risk, Naturally Uncommon and nine species are ranked as At Risk, Declining (Robertson *et al.* 2021; Appendix).

Seventeen (35%) of the bird species detected are ranked as Regionally Threatened under the New Zealand Threat Classification System, including six species ranked as Regionally Critical (pakahā / fluttering shearwater, *Puffinus gavia*; māpunga / black shag, *Phalacrocorax carbo*; matuku moana / reef heron; kārearea / NZ falcon; tarāpuka / black-billed gull, *Chroicocephalus bulleri* and taranui / Caspian tern), two species ranked as Regionally Endangered (kawau tikitiki / spotted shag and tara / white-fronted tern) and nine species ranked as Regionally Vulnerable (kororā / little penguin, *Eudyptula minor*; kawaupaka / little shag; kāruhiruhi / pied shag, *Phalacrocorax varius*; kawau tūi / little black shag, *Phalacrocorax sulcirostris*; tōrea pango / variable oystercatcher, *Haematopus unicolor*; poaka / pied stilt, *Himantopus himantopus*; pohowera / banded dotterel; tarāpunga / red-billed gull and pīhoihoi / NZ pipit, *Anthus novaeseelandiae* (Crisp 2020; Appendix).

The local species richness of native species appears to be fairly uniform along the Wellington City coastline. Local species richness appears to be 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 (Figure 3.1).



**Figure 3.1: Mean number of indigenous bird species recorded per 1 km survey section along the Wellington City coastline during four consecutive annual surveys carried out between 2018 and 2022.**

## 3.2 Abundance and distribution of coastal bird species

In this section of the report, we summarise the abundance and distribution of 11 of the 34 indigenous bird species that have been detected along the Wellington City coastline 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 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 terrestrial habitats (e.g., kārearea / NZ falcon and tūi, *Prosthemadera novaeseelandiae*), and coastal species that are irregular visitors to the Wellington City coastline have been excluded from this section but are listed in the Appendix.

### 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 Vulnerable (Crisp 2020)

A mean of 28 kawaupaka / little shags (range: 17-34 birds) have been counted along the Wellington City coastline each year during the four annual surveys carried out between 2018 and 2022. Kawaupaka / little shags are widespread along the Wellington City coastline, with noticeably higher densities present along the Wellington CBD, Evans Bay and northern

Miramar Peninsula foreshores (Figure 3.2). A total of 125 kawaupaka / little shags were counted along 460 km of the Wellington region coastline during 2017-2018 (McArthur *et al.* 2019), so the mean count of 28 birds recorded along the 55 km of Wellington City coastline surveyed represents 22% of the regional summer population of kawaupaka / little shags. An average of 0.51 kawaupaka / little shags were recorded per 1 km survey section along the Wellington City coastline between 2018 and 2022, which is 86% higher than the average density of 0.27 birds recorded along 460 km of the Wellington region coastline during 2017-2018 (McArthur *et al.* 2019). 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).

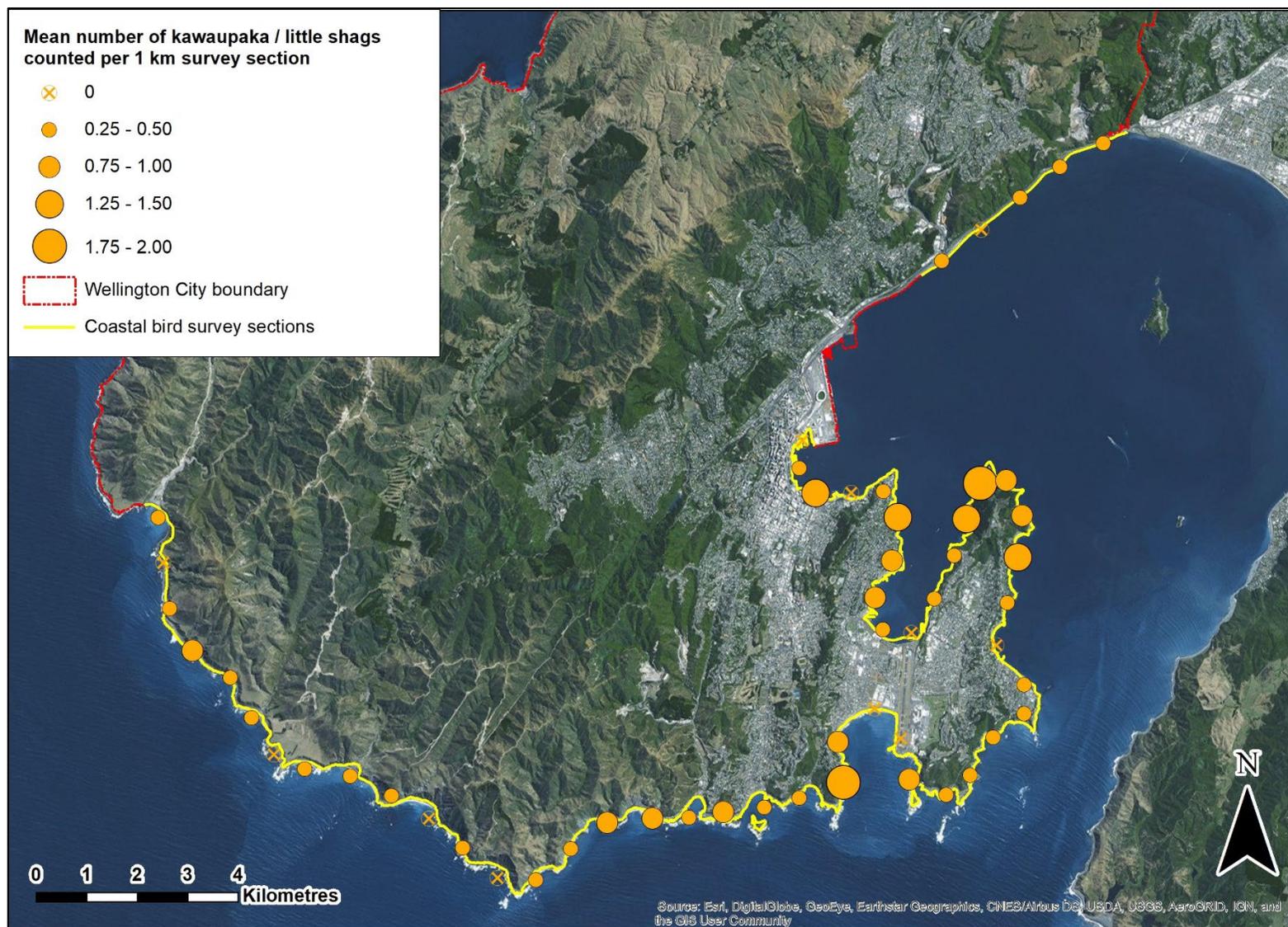


Figure 3.2: Distribution of kawaupaka / little shags along the Wellington City coastline between 2018 and 2022.

### 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 2020)

A mean of six māpunga / black shags (range: 3-9 birds) have been counted along the Wellington City coastline each year during the four annual surveys carried out between 2018 and 2022. Māpunga / black shags are uncommon along the Wellington City coastline and have only been recorded during these surveys at the northern tip of Miramar Peninsula, in Island and Lyall Bays and along the coastline between Oteranga Bay and Sinclair Head (Figure 3.3). A

total of 148 māpunga / black shags were counted along 460 km of the Wellington region coastline during 2017-2018 (McArthur *et al.* 2019), so the mean count of six birds recorded along the 55 km of Wellington City coastline surveyed represents 4% of the regional summer coastal population of māpunga / black shags. An average of 0.1 māpunga / black shags were recorded per 1 km survey section along the Wellington City coastline between 2018 and 2022, which is 68% lower than the average density of 0.32 birds recorded along 460 km of the Wellington region coastline during 2017-2018 (McArthur *et al.* 2019). 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 Wellington City and Kāpiti coastlines. This suggests that some form of competitive exclusion may be occurring between these two species, with pied shags being the more dominant of the two species (McArthur *et al.* 2019).

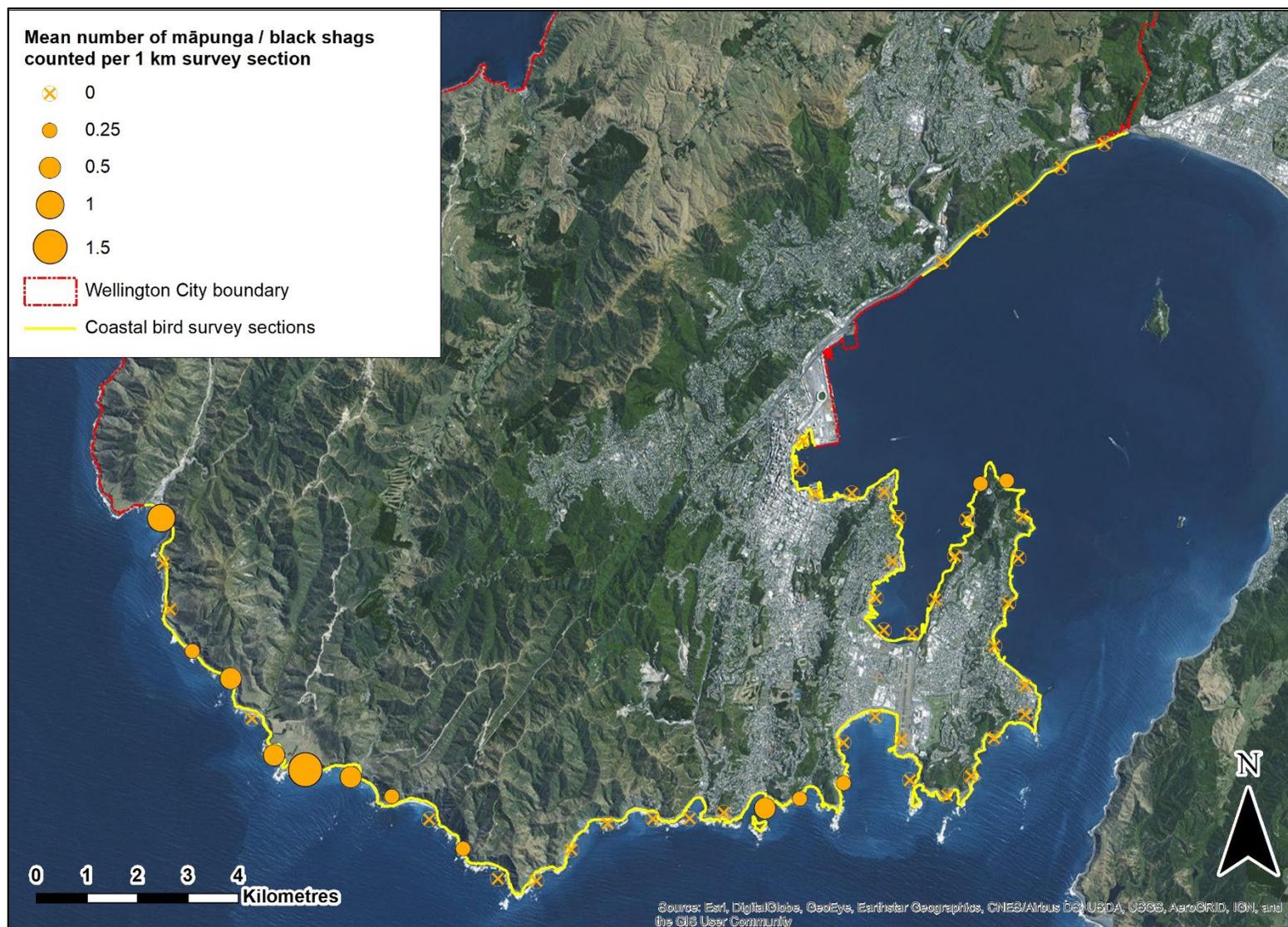


Figure 3.3: Distribution of mǎpunga / black shags along the Wellington City coastline between 2018 and 2022.

### 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 2020)

A mean of 34 kāruhiruhi / pied shags (range: 32-37 birds) have been counted along the Wellington City coastline each year during the four annual surveys carried out between 2018 and 2022. Kāruhiruhi / pied shags are fairly uniformly distributed along the

Wellington south coast and along the eastern coastline of Miramar Peninsula but appear to be less common in the inner harbour (Figure 3.4). A total of 474 kāruhiruhi / pied shags were counted along 460 km of the Wellington region coastline during 2017-2018 (McArthur *et al.* 2019), so the mean count of 34 birds recorded along the 55 km of 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 Wellington City coastline between 2018 and 2022, which is 32% lower than the average density of 1.03 birds recorded along 460 km of the Wellington region coastline during 2017-2018 (McArthur *et al.* 2019). Kāruhiruhi / pied shags have re-colonised the Wellington coastline comparatively recently, with the first breeding colony becoming established at the Makara 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, with pied shags being the more dominant of the two species (McArthur *et al.* 2019).

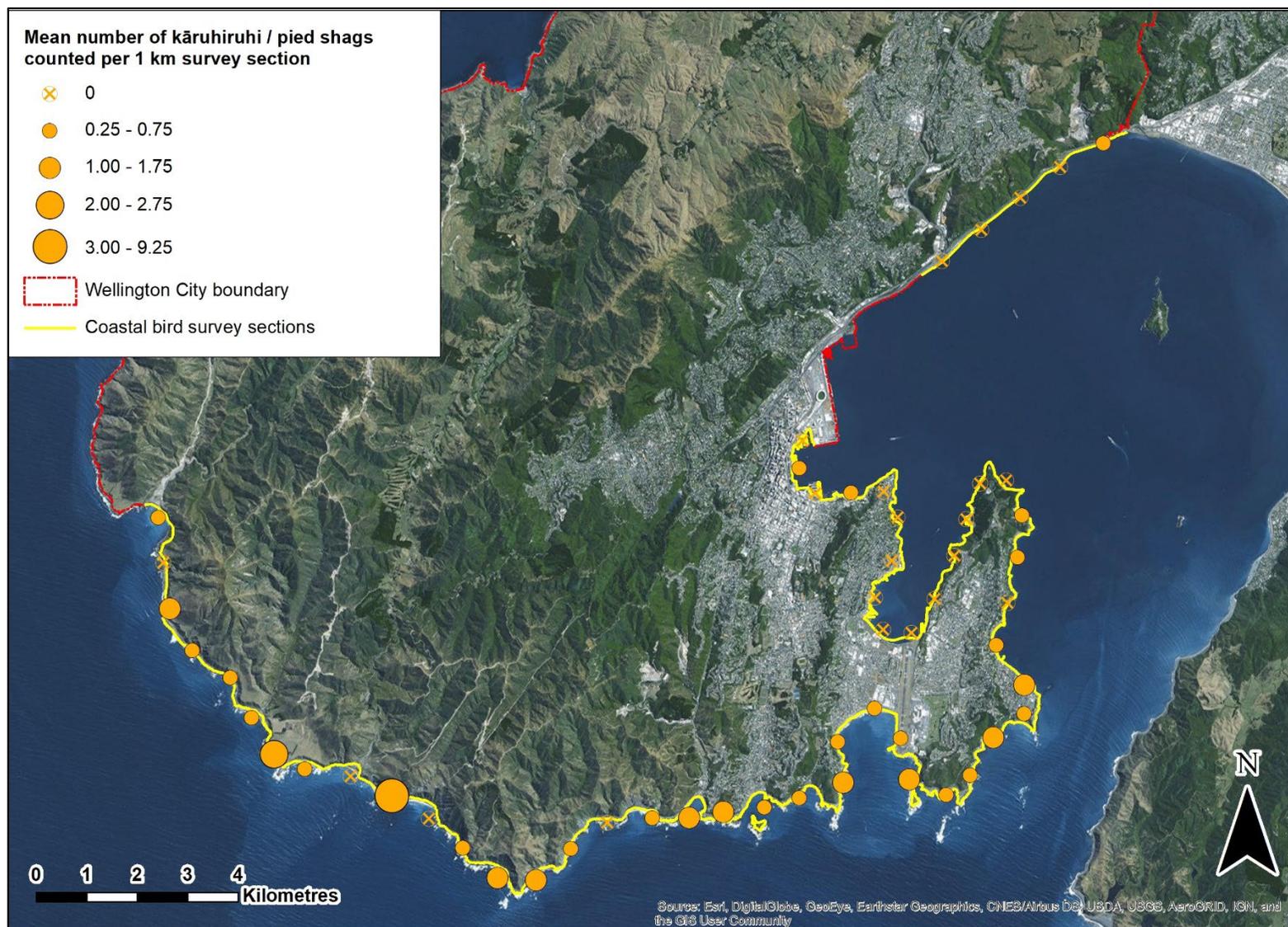


Figure 3.4: Distribution of kāruhiruhi / pied shags along the Wellington City coastline between 2018 and 2022.

### 3.2.4 Kawau tūi / 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 Vulnerable (Crisp 2020)

A mean of one kawau tūi / little black shag (range: 0-3 birds) has been counted along the Wellington City coastline each year during the three annual surveys carried out between 2018 and 2022. A total of ten kawau tūi / little black shags were counted along 460 km of the Wellington region coastline during 2017-2018 (McArthur *et al.* 2019), so the mean count of one bird recorded along the 55 km of Wellington City coastline surveyed represents 10% of the regional summer coastal population of kawau tūi / little black

shags (McArthur *et al.* 2019). Kawau tūi / 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 tūi / 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).

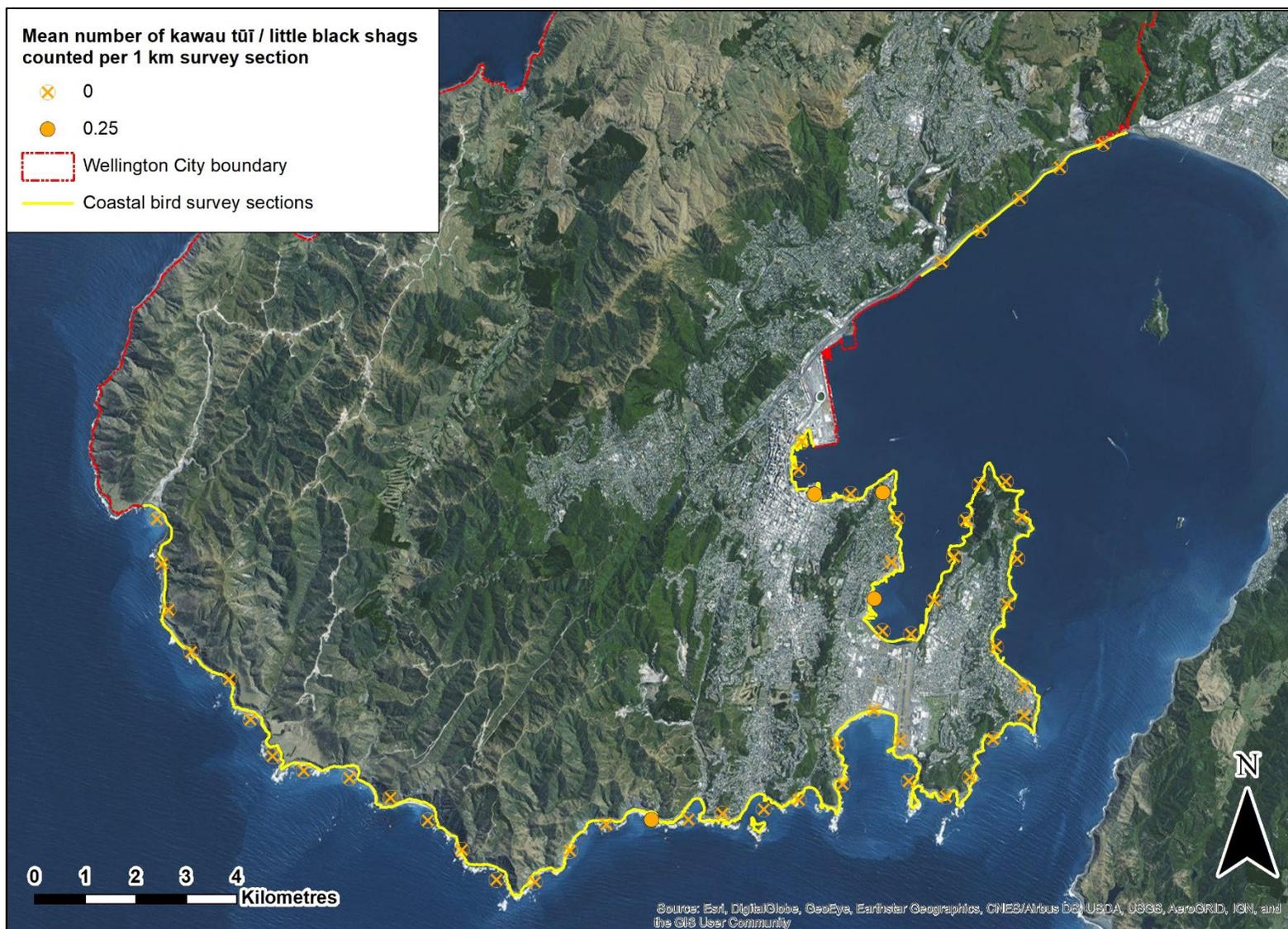


Figure 3.5: Distribution of kawau tūi / little black shags along the Wellington City coastline between 2018 and 2022.

### 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 Endangered (Crisp 2020)

A mean of eight kawau tikitiki / spotted shags (range: 3-14 birds) have been counted along the Wellington City coastline each year during the four annual surveys carried out between 2018 and 2022. Kawau tikitiki / spotted shags tend to be encountered along the inner harbour foreshore, including the Wellington City CBD, Evans Bay and northern Miramar Peninsula foreshore, which likely reflects the proximity of these areas to the large breeding colony present on Matiu/Somes Island (Waugh *et al.* 2013). A small number of kawau tikitiki / spotted shags are 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 (GWRC unpublished data). 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).

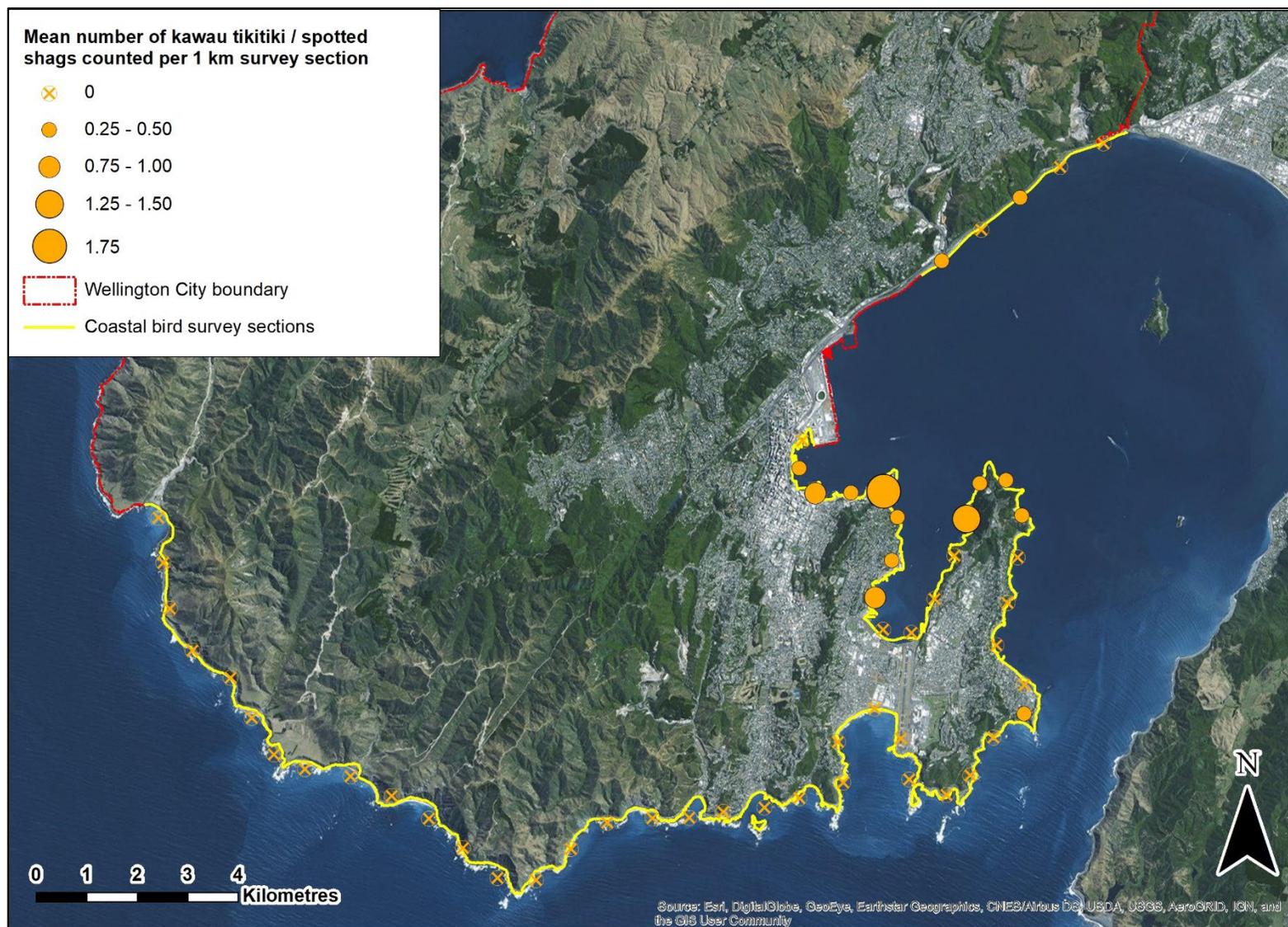


Figure 3.6: Distribution of kawau tikitiki / spotted shags along the Wellington City coastline between 2018 and 2022.

### 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 2020)

A mean of three matuku moana / reef herons (range: 2-5 birds) have been counted along the Wellington City coastline each year during the four annual surveys carried out between 2018 and 2022. Matuku moana / reef herons are largely restricted to Island Bay and adjacent

sections of the Wellington south coast between Sinclair and Palmer Heads (Figure 3.8), although they are occasionally encountered elsewhere along the Wellington City coastline, including along the Wellington CBD foreshore (eBird 2021). This survey has confirmed that matuku moana / reef herons have bred successfully on Taputeranga Island during three of the past four years (Figure 3.7), 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 15 matuku moana / reef herons were counted along 460 km of the Wellington region coastline during 2017-2018 (McArthur *et al.* 2019), confirming that the matuku moana / reef heron is now one of the Wellington region's rarest breeding bird species. The mean count of three matuku moana / reef herons counted along the Wellington City coastline between 2018 and 2022 therefore represents 20% of the regional breeding population of this species. Numbers in Te Whanganui-a-Tara / Wellington Harbour have apparently been relatively low 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 3.7: Juvenile matuku moana / reef heron (left hand bird) with two adults observed on Taputeranga Island, Island Bay on the 15<sup>th</sup> 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 courtesy of Jonathan Walter).**

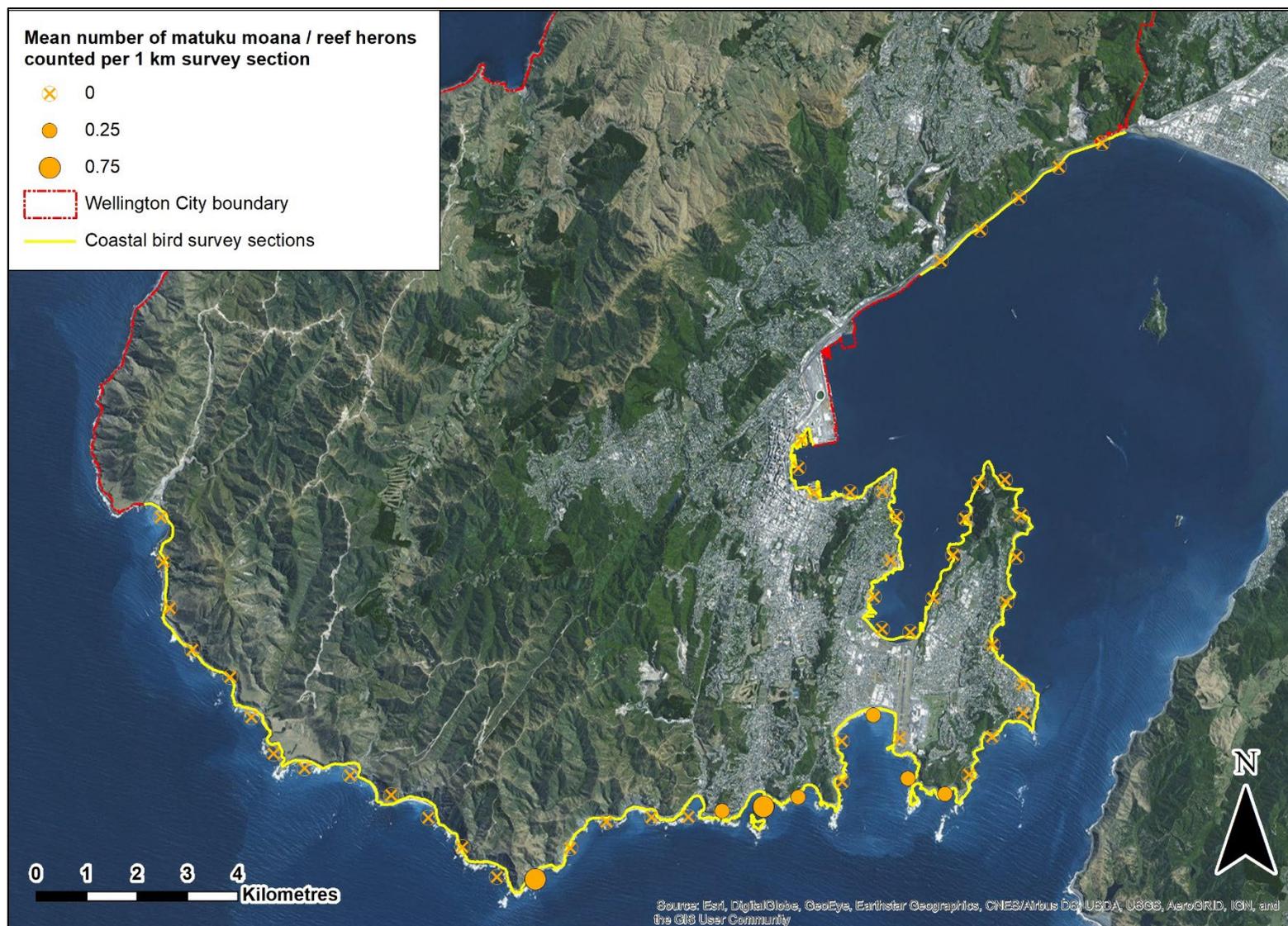


Figure 3.8: Distribution of matuku moana / reef herons along the Wellington City coastline between 2018 and 2022.

### 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 Vulnerable (Crisp 2020)

A mean of 83 tōrea pango / variable oystercatchers (range: 74-97 birds) have been counted along the Wellington City coastline each year during the four annual surveys carried out between 2018 and 2022.

Tōrea pango / variable oystercatchers appear to be fairly evenly distributed along the 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 (Figure 3.9).

A total of 712 tōrea pango / variable oystercatchers were counted along 460 km of the Wellington region coastline during 2017-2018 (McArthur *et al.* 2019), so the mean count of 83 birds recorded along the 55 km of Wellington City coastline surveyed represents 12% of the regional tōrea pango / variable oystercatcher population. An average of 1.5 tōrea pango / variable oystercatchers were recorded per 1 km survey section along the Wellington City coastline between 2018 and 2022, which is identical to the average density of 1.5 birds recorded along 460 km of the Wellington region coastline during 2017-2018 (McArthur *et al.* 2019).

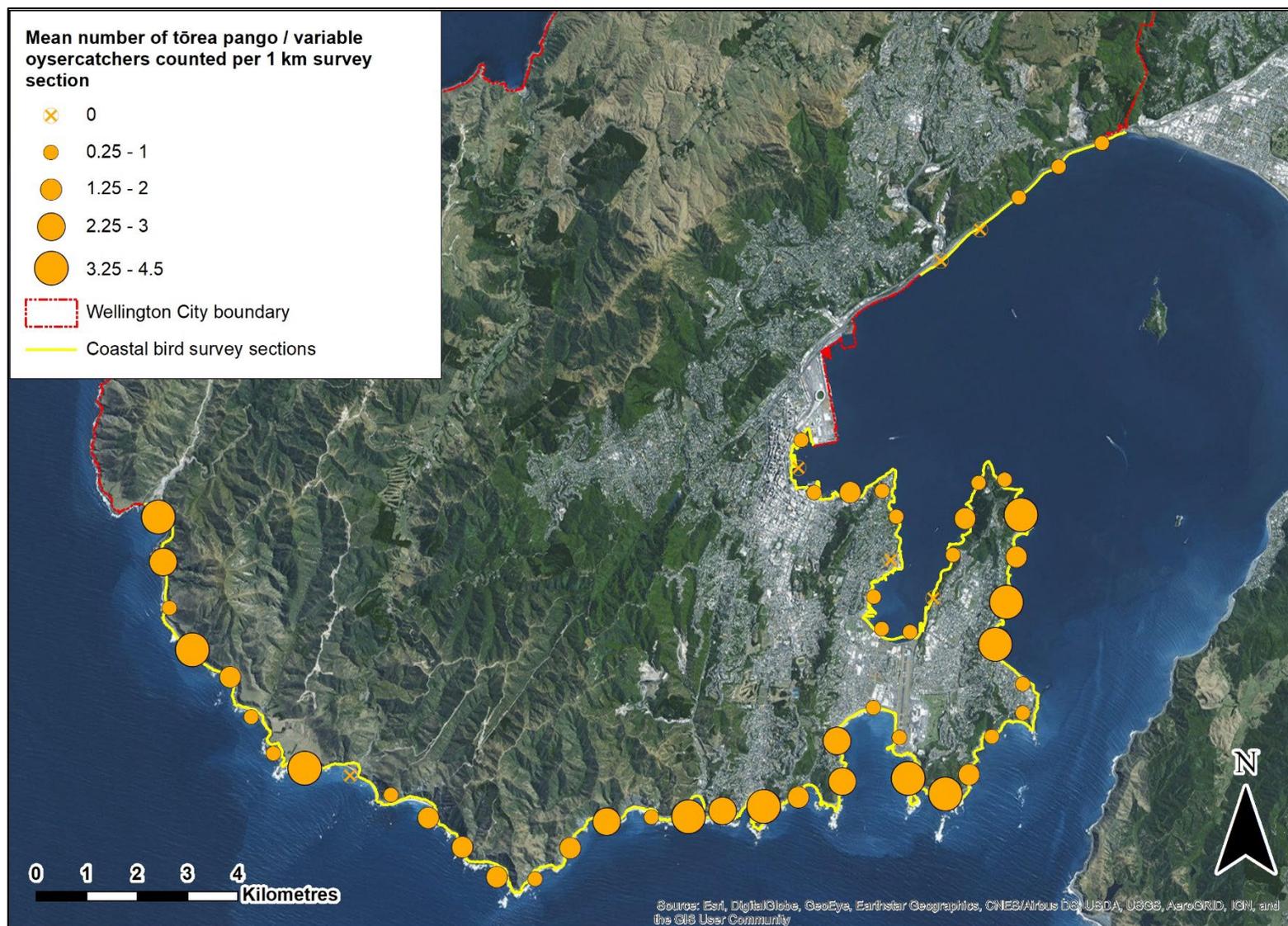


Figure 3.9: Distribution of tōrea pango / variable oystercatchers along the Wellington City coastline between 2018 and 2022.

### 3.2.8 Pohowera / Banded dotterel (*Charadrius bicinctus*)



Image courtesy of Rebecca Bowater/NZ Birds Online

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

**Regional conservation status:** Regionally Vulnerable (Crisp 2020)

A mean of 28 pohowera / banded dotterels (range: 24-33 birds) have been counted along the Wellington City coastline each year during the four annual surveys carried out between 2018 and 2022. Pohowera / banded dotterels are very localised along the 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 Sinclair Head (Figure 3.10). Approximately 728 adult pohowera / banded dotterels are estimated to be present in the Wellington region, with 346 of these found along the Wellington region coastline and the remainder found along the region's braided rivers (McArthur *et al.* 2019). The mean of 28 tūturiwhatu / banded dotterels counted along the 55 km of Wellington City coastline surveyed therefore represents 4% of the regional population and 8% of the dotterels present along the Wellington region coastline.

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 9<sup>th</sup> of January 2020 was recovered dead on the Wellington International Airport runway some four months later on the 15<sup>th</sup> 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 12<sup>th</sup> of January 2021 was re-sighted alive at the southern end of Wellington International Airport on the 11<sup>th</sup> 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).

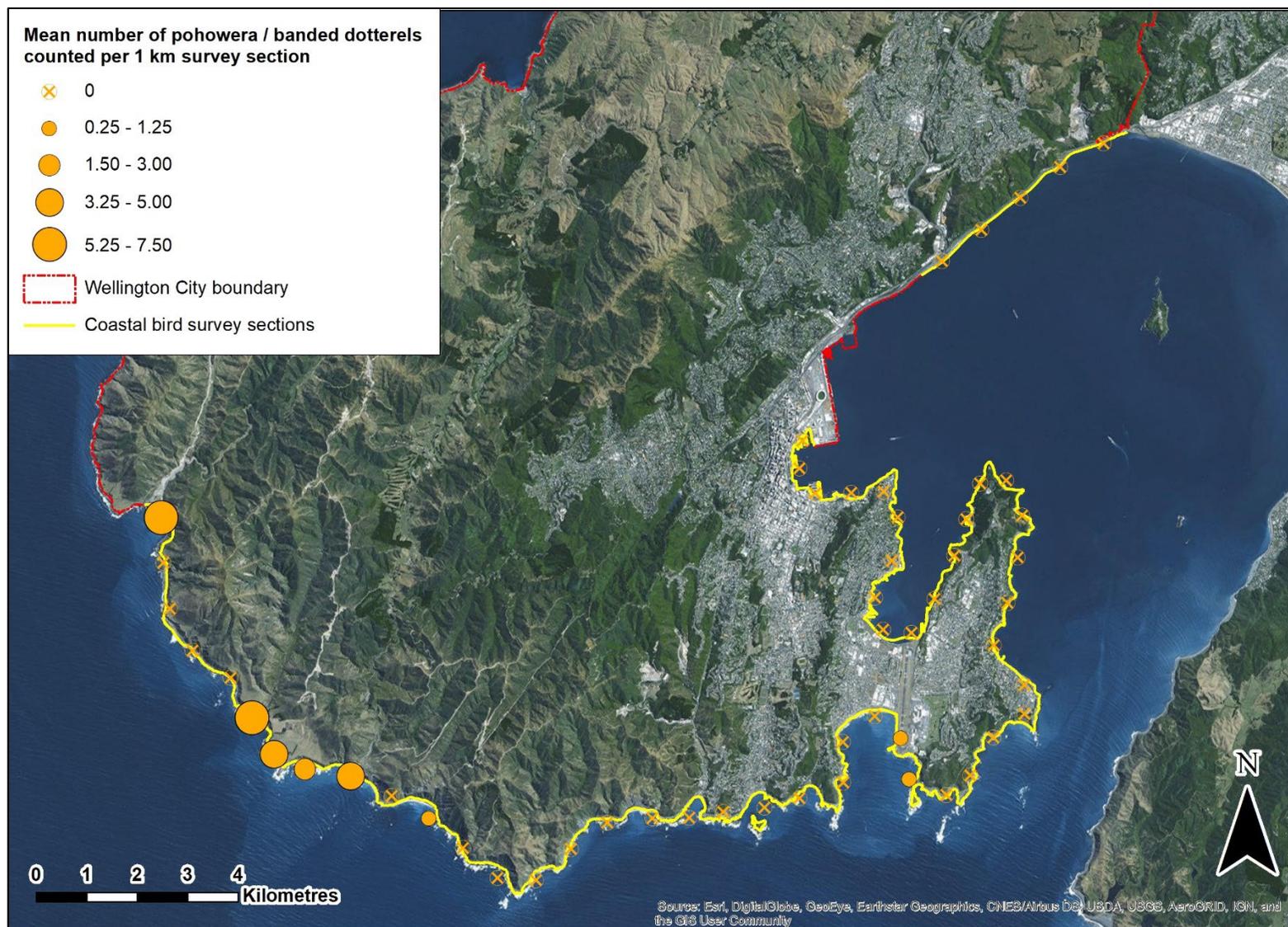


Figure 3.10: Distribution of pohowera / banded dotterels along the Wellington City coastline between 2018 and 2022.

### 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 2020)

A mean of 480 tarāpunga / red-billed gulls (range: 353-677 birds) have been counted along the Wellington City coastline each year during the four annual surveys carried out between 2018 and 2022. A small nesting colony has been present on rock stacks and cliff faces at Point Dorset each year and is the only tarāpunga / red-billed gull colony that has been found along the Wellington City coastline during these surveys (McArthur *et al.* 2019). Tarāpunga / red-billed gulls are fairly uniformly distributed along the Wellington city coastline, although they appear to occur at lower densities to the west of Sinclair Head (Figure 3.11). 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 have come from South Island breeding colonies (Robertson 1992).

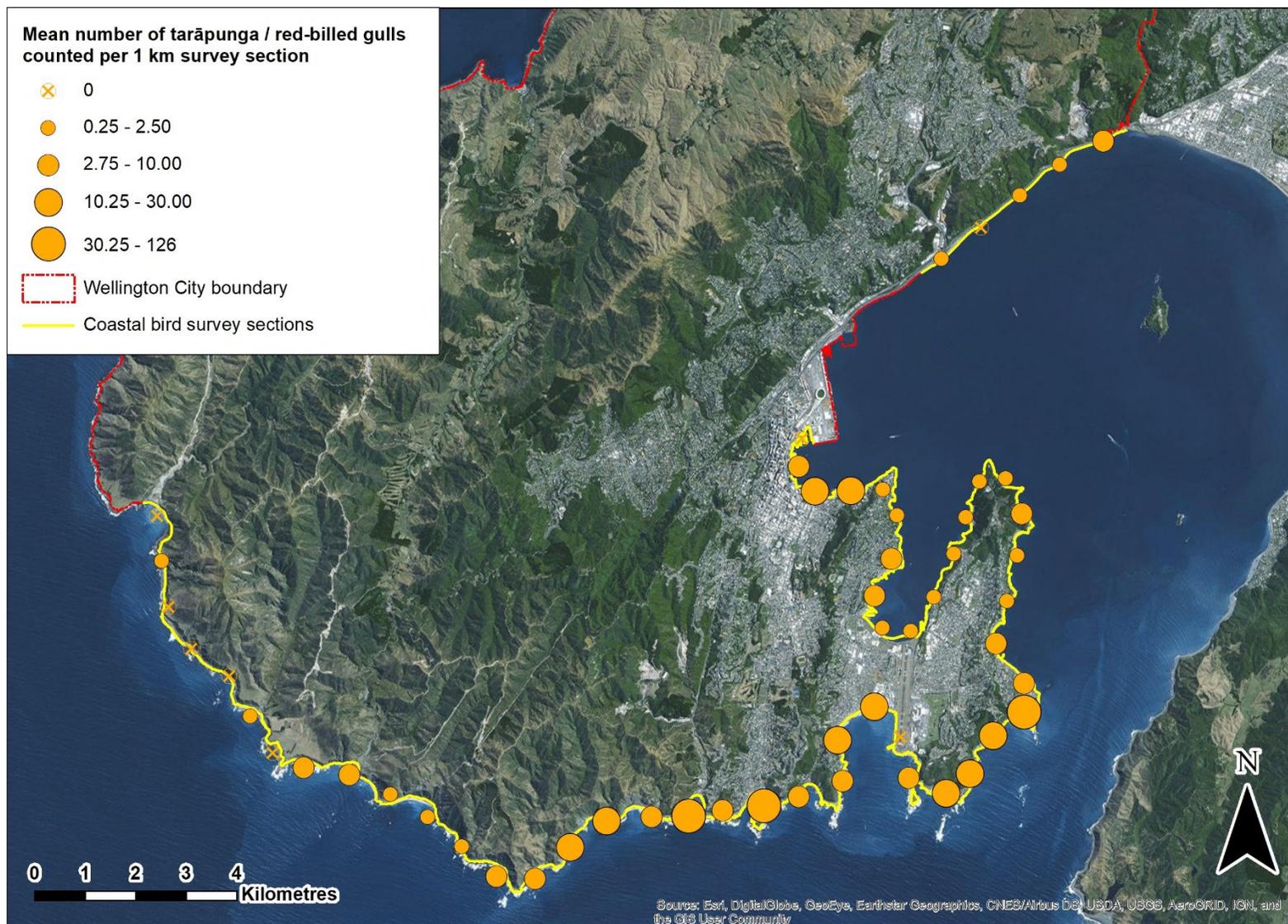


Figure 3.11: Distribution of tarāpunga / red-billed gulls along the Wellington City coastline between 2018 and 2022.

### 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 2020)

A mean of 154 tara / white-fronted terns (range: 49-420 birds) have been counted along the Wellington City coastline each year during the four annual surveys carried out between 2018 and 2022. A small nesting colony has been present on rock stacks and cliff faces at Point Dorset each year and is the only tara / white-fronted tern colony that has been found along the mainland Wellington City coastline during these

surveys (McArthur *et al.* 2019). Tara / white-fronted terns are fairly uniformly distributed along the Wellington city coastline, although they appear to occur at lower densities to the west of Owhiro Bay (Figure 3.12). 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).

Six tara / white-fronted tern colonies were detected along 460 km of the Wellington region coastline during 2017-2018, on Kāpiti, Mana and Mākaro/Ward Islands, as well as at Point Dorset (Miramar Peninsula), Te Awaiti and Honeycomb Rock (eastern Wairarapa) (McArthur *et al.* 2019). Given that two thirds of these colonies were found along the Wellington City, Porirua and Kāpiti coastlines, it appears that the west coast of the Wellington region, including the Wellington City coastline, is a regional stronghold for this species.

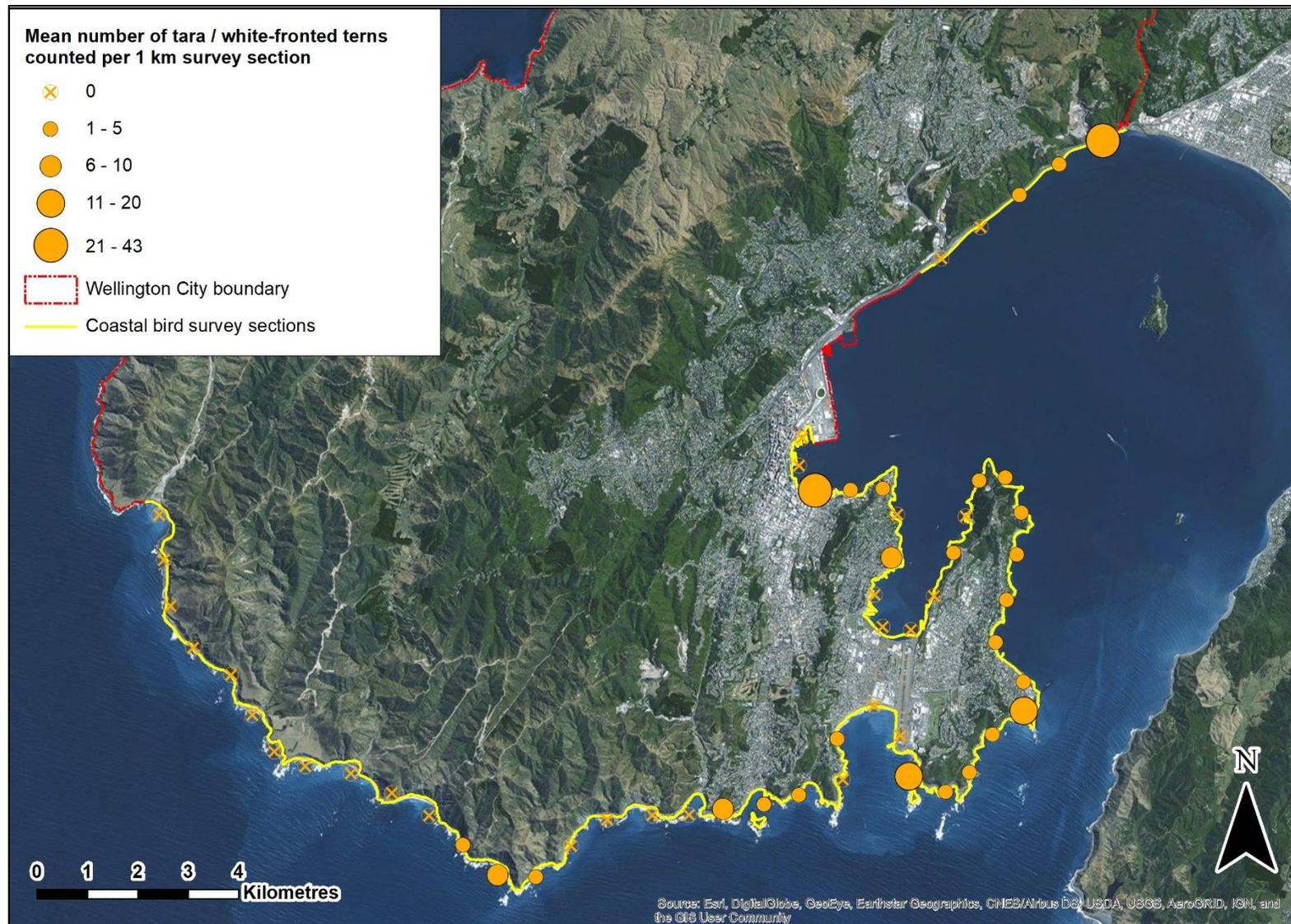


Figure 3.12: Distribution of tara / white-fronted terns along the Wellington City coastline between 2018 and 2022.

### 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 Vulnerable (Crisp 2020)

A mean of 10 pīhoihoi / NZ pipits (range: 7-13 birds) have been counted along the Wellington City coastline each year during the four annual surveys carried out between 2018 and 2022. Within the survey area, pīhoihoi / NZ pipits appear to be entirely restricted to the Wellington south coast between Owhiro and Oteranga Bays (Figure 3.13), 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 Miramar Peninsula (eBird 2021). A total of 80 pīhoihoi / NZ pipits were counted along 460 km of the Wellington region coastline during 2017-2018 (McArthur *et al.* 2019), so the mean count of 11 birds recorded along the 55 km of Wellington City coastline surveyed represents 14% of the regional coastal population of pīhoihoi / NZ pipits. An average of 0.2 pīhoihoi / NZ pipits were recorded per 1 km survey section along the Wellington City coastline between 2018 and 2022, which is 18% higher than the average density of 0.17 birds recorded along 460 km of the Wellington region coastline during 2017-2018 (McArthur *et al.* 2019).

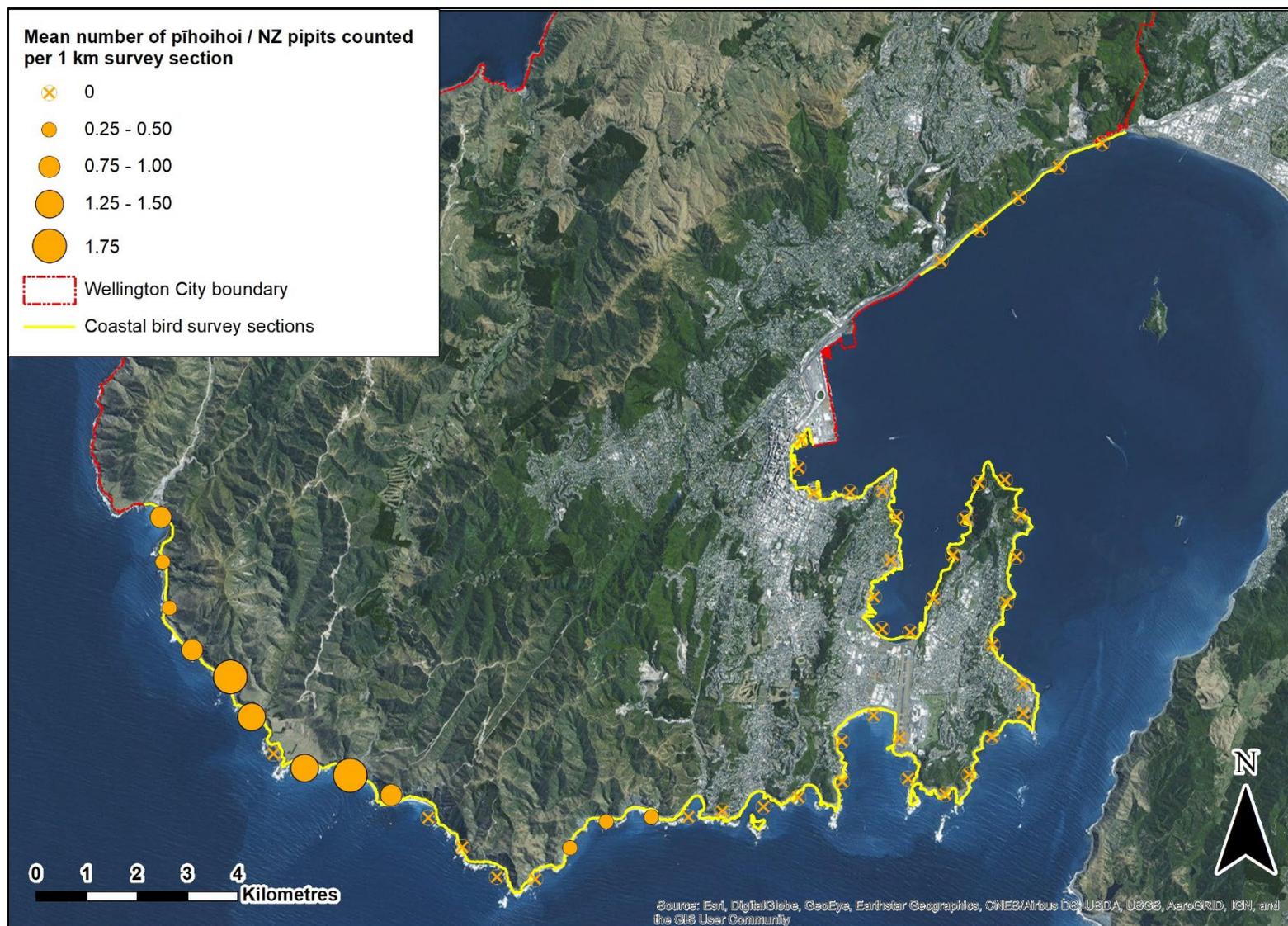


Figure 3.13: Distribution of pīhoihoi / New Zealand pipits along the Wellington City coastline between 2018 and 2022.

## 4. Discussion

The four annual bird surveys carried out along the Wellington City coastline between 2018 and 2022 have identified four stretches of coast that play particularly significant roles in maintaining indigenous coastal bird values within Wellington City.

The cliffs and rock stacks at Point Dorset on 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 Wellington City.

Taputeranga Island in Island Bay is one of only four known 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 Wellington south coast between Oteranga Bay and Sinclair Head provides habitat for the majority of pohowera / banded dotterels breeding in Wellington City, representing 8% of the total number of coastal breeding pohowera / banded dotterels known to be breeding in the greater Wellington region. This stretch of coastline also supports the majority of pīhoihoi / NZ pipits to be found along the Wellington City coastline, representing an estimated 14% of the total number of pīhoihoi / NZ pipits to be found along the greater Wellington region coastline. This section of the Wellington City coastline is extremely popular with off-road vehicle enthusiasts, fishers and divers, and off-road vehicles and other recreational activities are causing substantial amounts of disturbance to ground-nesting species along this stretch of coastline, including pohowera / banded dotterels, tōrea pango / variable oystercatchers and pīhoihoi / NZ pipits.

The foreshore at the southern end of the Wellington International Airport runway and a small area of saltmarsh habitat adjacent to the runway itself supports a small breeding population of pohowera / banded dotterels and is the only location on the Wellington City coastline east of Sinclair Head where these birds currently breed.

Three of these sites (Point Dorset, 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 Sinclair Head is not currently included within an existing 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).

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 a reduction in the extent of intertidal foraging habitats for these species, and due to a steepening of the foreshore above mean high water springs, leading to a reduction in high tide roosts. Such 'hardening' of the 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 structures designed to provide high tide roosts for the indigenous coastal bird species known to be present along the affected section of coastline.

Nineteen of the 48 bird species recorded during these bird surveys (40%) 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 nineteen 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 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 Wellington City coastline may be twice as high as previously thought. The sea level along parts of the 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<sup>1</sup>. The potential effects of this sea level rise on 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 Wellington City coastline and its bird values.

These surveys have succeeded in creating a detailed and up-to-date picture of the diversity, abundance and distribution of indigenous birds along the Wellington City coastline. We recommend 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.

---

<sup>1</sup> <https://www.searise.nz/maps>; accessed 08/06/2022.

## 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 Oteranga Bay via Terawhiti Station and Rebecca Lunt, Annette Harvey and Roger Uys all 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 (OSNZ). 2022. *Checklist of the Birds of New Zealand (5th edition)*. Ornithological Society of New Zealand Occasional Publication No. 1. Ornithological Society of New Zealand, Wellington.
- Crisp, P. 2020. *Conservation status of native bird species in the Wellington region*. Publication No. GW/ESCI-G-20/75, Greater Wellington Regional Council, Wellington.
- Department of Conservation, 2010. *New Zealand Coastal Policy Statement 2010*. Department of Conservation, Wellington.
- eBird, 2021. eBird: An online database of bird distribution and abundance [web application]. eBird, Ithaca, New York. Available: <http://www.eBird.org>. (Accessed: 03/06/2021).
- 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.; 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.

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

This appendix contains a list of all the bird species encountered during the Wellington City coastal bird surveys carried out between 2018 and 2022 (P = species detected). Scientific names, common names (both Māori and English) and taxonomic order have been sourced from Checklist Committee (OSNZ) (2022). The national threat rankings used are those New Zealand Threat Classification System rankings listed in Robertson *et al.* (2021) and the regional threat rankings are those listed in Crisp (2020).

Māori name	Common name	Scientific name	National threat ranking	Regional threat ranking	2018	2019	2020	2021
kuihi	Canada goose	<i>Branta canadensis</i>	Introduced and Naturalised	Introduced and Naturalised	P			
pūtangitangi	paradise shelduck	<i>Tadorna variegata</i>	Not Threatened	Not Threatened	P	P	P	
rakiraki	mallard	<i>Anas platyrhynchos</i>	Introduced and Naturalised	Introduced and Naturalised	P	P	P	P
kererū aropari	rock pigeon	<i>Columba livia</i>	Introduced and Naturalised	Introduced and Naturalised	P	P	P	P
kererū	New Zealand pigeon	<i>Hemiphaga novaeseelandiae</i>	Not Threatened	At Risk, Recovering				P
pīpīwharau	shining cuckoo	<i>Chrysococcyx lucidus</i>	Not Threatened	Not Threatened				P
tōrea pango	variable oystercatcher	<i>Haematopus unicolor</i>	At Risk, Recovering	Regionally Vulnerable	P	P	P	P
tōrea	South Island pied oystercatcher	<i>Haematopus finschi</i>	At Risk, Declining	Migrant			P	
poaka	pied stilt	<i>Himantopus himantopus</i>	Not Threatened	Regionally Vulnerable		P	P	P
pohowera	banded dotterel	<i>Charadrius bicinctus</i>	At Risk, Declining	Regionally Vulnerable	P	P	P	P

Māori name	Common name	Scientific name	National threat ranking	Regional threat ranking	2018	2019	2020	2021
	spur-winged plover	<i>Vanellus miles</i>	Not Threatened	Not Threatened	P	P	P	P
tarāpunga	red-billed gull	<i>Chroicocephalus novaehollandiae</i>	At Risk, Declining	Regionally Vulnerable	P	P	P	P
tarāpuka	black-billed gull	<i>Chroicocephalus bulleri</i>	At Risk, Declining	Regionally Critical			P	
karoro	southern black-backed gull	<i>Larus dominicanus</i>	Not Threatened	Not Threatened	P	P	P	P
taranui	Caspian tern	<i>Hydroprogne caspia</i>	Nationally Vulnerable	Regionally Critical			P	
tara	white-fronted tern	<i>Sterna striata</i>	At Risk, Declining	Regionally Endangered	P	P	P	P
kororā	little penguin	<i>Eudyptula minor</i>	At Risk, Declining	Regionally Vulnerable	P	P		P
toroa	white-capped albatross	<i>Thalassarche cauta</i>	At Risk, Declining	Migrant				P
pāngurunguru	northern giant petrel	<i>Macronectes halli</i>	At Risk, Recovering	Migrant		P		
pakahā	fluttering shearwater	<i>Puffinus gavia</i>	At Risk, Relict	Regionally Critical		P	P	P
tākapu	Australasian gannet	<i>Morus serrator</i>	Not Threatened	Migrant	P	P	P	P
kawaupaka	little shag	<i>Microcarbo melanoleucos</i>	At Risk, Relict	Regionally Vulnerable	P	P	P	P
māpunga	black shag	<i>Phalacrocorax carbo</i>	At Risk, Relict	Regionally Critical	P	P	P	P
kāruhiruhi	pied shag	<i>Phalacrocorax varius</i>	At Risk, Recovering	Regionally Vulnerable	P	P	P	P
kawau tūi	little black shag	<i>Phalacrocorax sulcirostris</i>	At Risk, Naturally Uncommon	Regionally Vulnerable			P	P

Māori name	Common name	Scientific name	National threat ranking	Regional threat ranking	2018	2019	2020	2021
kawau tikitiki	spotted shag	<i>Phalacrocorax punctatus</i>	Nationally Vulnerable	Regionally Endangered	P	P	P	P
matuku moana	white-faced heron	<i>Egretta novaehollandiae</i>	Not Threatened	Not Threatened	P	P	P	P
matuku moana	reef heron	<i>Egretta sacra</i>	Nationally Endangered	Regionally Critical	P	P	P	P
kāhu	swamp harrier	<i>Circus approximans</i>	Not Threatened	Not Threatened		P		
kōtare	New Zealand kingfisher	<i>Todiramphus sanctus</i>	Not Threatened	Not Threatened				P
kārearea	New Zealand falcon	<i>Falco novaeseelandiae</i>	Nationally Increasing	Regionally Critical	P			
tūī	tūī	<i>Prosthemadera novaeseelandiae</i>	Not Threatened	Not Threatened	P	P	P	P
riroriro	grey warbler	<i>Gerygone igata</i>	Not Threatened	Not Threatened		P	P	P
makipai	Australian magpie	<i>Gymnorhina tibicen</i>	Introduced and Naturalised	Introduced and Naturalised	P			
pīwakawaka	New Zealand fantail	<i>Rhipidura fuliginosa</i>	Not Threatened	Not Threatened		P	P	P
kairaka	Eurasian skylark	<i>Alauda arvensis</i>	Introduced and Naturalised	Introduced and Naturalised		P	P	P
warou	welcome swallow	<i>Hirundo neoxena</i>	Not Threatened	Not Threatened	P	P	P	P
tauhou	silveryeye	<i>Zosterops lateralis</i>	Not Threatened	Not Threatened		P	P	P
tāringi	common starling	<i>Sturnus vulgaris</i>	Introduced and Naturalised	Introduced and Naturalised	P	P	P	P
manu pango	Eurasian blackbird	<i>Turdus merula</i>	Introduced and Naturalised	Introduced and Naturalised	P	P	P	P
manu-kai-hua-rakau	song thrush	<i>T. philomelos</i>	Introduced and Naturalised	Introduced and Naturalised		P		P

Māori name	Common name	Scientific name	National threat ranking	Regional threat ranking	2018	2019	2020	2021
	dunnock	<i>Prunella modularis</i>	Introduced and Naturalised	Introduced and Naturalised	P	P	P	P
tiu	house sparrow	<i>Passer domesticus</i>	Introduced and Naturalised	Introduced and Naturalised	P	P	P	P
pīhoihoi	New Zealand pipit	<i>Anthus novaeseelandiae</i>	At Risk, Declining	Regionally Vulnerable	P	P	P	P
pahirini	chaffinch	<i>Fringilla coelebs</i>	Introduced and Naturalised	Introduced and Naturalised	P	P	P	P
	European greenfinch	<i>Chloris chloris</i>	Introduced and Naturalised	Introduced and Naturalised	P	P	P	P
kōurarini	European goldfinch	<i>Carduelis carduelis</i>	Introduced and Naturalised	Introduced and Naturalised	P	P	P	P
hurukōwhai	yellowhammer	<i>Emberiza citrinella</i>	Introduced and Naturalised	Introduced and Naturalised		P	P	P