State and trends in the diversity, abundance and distribution of coastal birds in the Wellington region

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Cover Image: An adult tōrea pango / variable oystercatcher (*Haematopus unicolor)* photographed sitting on a nest at Waikanae Estuary on the 11th of February 2023.
Image credit: Christopher Tuffley / Macaulay Library ML541089041.

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Executive Summary

The 460 kilometres of coastline in the Wellington region supports a high number of indigenous bird species, many of which are ranked as either Nationally Threatened or At Risk under the New Zealand Threat Classification System. Greater Wellington Regional Council (GWRC) is one of several agencies that have statutory responsibilities relating to the sustainable management of the natural values of the Wellington region coastline, including its indigenous bird values. To discharge these responsibilities as efficiently and effectively as possible, GWRC conducts regional coastal bird surveys to identify the indigenous bird values of the Wellington region coastline, and the spatial distribution of those values. GWRC carried out the first ever complete survey of the indigenous bird values of the Wellington region coastline during the summers of 2017 and 2018, creating a baseline measure of the diversity, distribution and abundance of indigenous birds inhabiting Wellington region's coastline. During the summers of 2022 and 2023, GWRC repeated this survey to investigate population trends among Wellington's coastal bird species, and to identify any changes in bird distribution that have occurred since the 2017-2018 survey.

During both surveys, a total of 450 km of coastline was traversed either by foot or by boat, and the presence and number of all species of birds and marine mammals encountered was recorded for each separate 1 km section of coastline surveyed to enable spatial patterns in the relative abundance of key species to be mapped to a 1 km resolution.

Sixty-eight bird species and 21,357 individual birds were counted during the 2022-2023 bird survey, which was almost identical to those counted during the 2017-2018 survey. There has been no change in the mean number of indigenous birds counted per km since 2017-2018, however the mean number of indigenous bird species counted per km has increased from 4.9 species/km to 5.6 species/km. This indicates that a number of species have increased in distribution in the Wellington region during this period, including the poaka / pied stilt, black-fronted dotterel, tūturiwhatu / NZ dotterel, kāruhiruhi / pied shag and pihoihoi / NZ pipit.

Forty-nine (72%) of the 68 bird species detected during the 2022-2023 survey are indigenous to New Zealand. Twenty-nine of the bird species detected (43%) are ranked as either Nationally Threatened or Nationally At-Risk under the New Zealand Threat Classification System, and 25 bird species detected (37%) are ranked as Regionally Threatened or Regionally At-Risk. Both the diversity and total abundance of indigenous birds varied considerably along the Wellington region coastline. During both surveys, the larger estuaries and river mouths were hotspots of high species diversity and abundance, as well as the coastlines of Kāpiti, Mana and Matiu-Somes Islands, and Ōnoke Spit and Castlepoint Lagoon. Stretches of the mainland coastline that possessed a heterogeneous mix of habitats including a mix of sandy or shingle beaches and intertidal rock platforms also supported a higher diversity and abundance of indigenous bird species, including the Wellington Harbour foreshore and the coastlines of Titahi Bay, Plimmerton, Tora and Castlepoint. In contrast, stretches of the mainland coastline that possessed homogenous stretches of uninterrupted sandy and shingle beaches, coastal cliffs and bluffs, or had been 'hardened' with coastal defences supported a relatively low diversity and total abundance of indigenous bird species.

The number of pōhowera / banded dotterels breeding along the Wellington region coastline has declined by 25% since 2017-2018, contributing to a 21% decline in the regional breeding population over the same time period, at a mean annual rate of decline of 4.6%. This regional rate of decline is greater than the national rate of decline and will result in a halving in the number of pōhowera /

banded dotterels breeding in the Wellington region every 15-16 years. Over the same time period, the number of black-fronted dotterels breeding along the Wellington coastline has increased by 425%, possibly due to the displacement of birds from Wairarapa rivers due to flooding that occurred in 2022. Taranui / Caspian terns appear not to have attempted to nest on Ōnoke Spit, the site of the Wellington region's only breeding colony, since the summer of 2018-2019. As a result, it is growing increasingly likely that taranui / Caspian terns have been extirpated as a breeding bird in the Wellington region and is now present in the region as a migrant only. The number of tūturiwhatu / New Zealand dotterels breeding along the Wellington region coastline has increased by 93% since 2017-2018, and this species has now been observed breeding at nine sites along the Wellington region coastline, including two sites on the Kāpiti coast and seven sites on along the eastern Wairarapa coastline. Kāruhiruhi / pied shags are continuing to slowly expand their distribution eastwards into the Wairarapa and are now known to breed at eight colonies in the Wellington region. Poaka / pied stilt numbers along the Wellington region coastline have increased by 63% since 2017-2018, whereas matuku moana / reef heron and tōrea pango / variable oystercatcher numbers have been relatively stable over the same period.

It is recommended that the results of these surveys be used to update Schedule F2c of Wellington's Natural Resources Plan, which identifies sites of significance for indigenous birds in the region's coastal and freshwater habitats. These survey data should also be used to inform the next re-assessment of the regional threat rankings of Wellington's birds, scheduled to be carried out by 2028. These data can also be used to improve GWRC's readiness to respond to oiled wildlife incidents, and to inform the processing of resource consent applications submitted for sites in Wellington's Coastal Marine Area. It is also recommended that this regional coastal bird survey continues to be repeated at five-yearly intervals so that GWRC can continue to maintain an up-to-date picture of the coastal bird values of the Wellington region and how they continue to change over time, with the next survey due to be carried out during the summers of 2027 and 2028.

Keywords: Coastal bird, Greater Wellington Regional Council, Maritime New Zealand, New Zealand Threat Classification System, oiled wildlife response, Wellington Natural Resources Plan, Wellington region

1. Introduction

The 460 kilometres of coastline in the Wellington region supports a high number of indigenous bird species, many of which are ranked as either Nationally Threatened or At Risk under the New Zealand Threat Classification System (NZTCS) (McArthur *et al.* 2019; Robertson *et al.* 2021). A number of these species are heavily reliant on habitats within Wellington's coastal marine area for foraging, roosting and breeding either year-round, or during key parts of their annual lifecycles. Furthermore, many of these species are particularly vulnerable to human activities that result in the disturbance, degradation or destruction of these habitats, including human-induced climate change (Woodley, 2012; Gartrell *et al*. 2019; Rolfe *et al.* 2021; McArthur *et al.* 2024).

Greater Wellington Regional Council (GWRC) is one of several agencies that have statutory responsibilities relating to the sustainable management of the natural values of the Wellington region coastline, including its indigenous bird values. Regional councils and unitary authorities in New Zealand have a statutory responsibility under the Resource Management Act (1991) to sustainably manage coastal environments in New Zealand. Under the Resource Management Act, all regional councils are required to prepare a Regional Coastal Plan that gives effect to the New Zealand Coastal Policy Statement (NZCPS) (DOC, 2010). The purpose of these plans is to assist councils in achieving the sustainable management of their coastal environments, by outlining objectives, policies and rules that govern which activities councils will allow, control or prohibit in the coastal environment. As with a number of other regions, Wellington's Regional Coastal Plan isn't a stand-alone document. Rather, it has been incorporated into a 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, 2023).

Section 6(c) of the Resource Management Act provides a mechanism that contributes to the sustainable management of coastal sites with high natural values, by directing Wellington's 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 have 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, 2015 and 2019 have identified a total of 69 coastal sites that meet these Policy 23 translation criteria, 30 of which are currently listed as "habitats of significance for indigenous birds" in Wellington's Natural Resources Plan (McArthur & Lawson, 2013; McArthur *et al*., 2015; McArthur *et al.* 2019; GWRC, 2023).

A large number of the indigenous bird species that occupy the Wellington region coastline are highly mobile, undertaking daily, seasonal and annual movements between different habitats, at a range of spatial scales ranging from less than a dozen to tens of thousands of kilometres. The National Policy Statement for Indigenous Biodiversity (NPS-IB), which came into effect on the 4th of August 2023, directs regional councils to identify and manage areas that support "highly mobile fauna" to maintain populations across their range (MFE, 2023). Although the NPS-IB does not include a definition for "highly mobile fauna"[1], it does provide a list of 49 specified highly mobile fauna, 25 (51%) of which are

[1] Although the NPS-IB does not define the term "highly mobile fauna", the Department of Conservation has defined "highly mobile fauna" as "those that use the environment at regional and national landscape scales,

bird species which are either resident or seasonal visitors to the coastline of the Wellington region (McArthur *et al.* 2019; MFE, 2023).

Maritime New Zealand (MNZ) and GWRC also share a statutory responsibility to maintain a readiness to respond to marine oil spill incidents in New Zealand, including the management of oiled wildlife. Under Sections 283 and 284 of the Maritime Transport Act (1994), MNZ is required to create and update a New Zealand Marine Oil Spill Readiness and Response Strategy, outlining how MNZ and its partners will respond to a marine oil spill incident in New Zealand (MNZ, 2018). As part of this strategy, MNZ has entered into Memoranda of Understanding with local government agencies including GWRC, to build national- and regional-scale capability and infrastructure to respond to marine oil spill incidents. Under this MOU, GWRC has committed to contribute expertise, equipment and other resources to respond to both Tier 2 and Tier 3 oil spills – those spills that occur at a scale or for a duration that is beyond the capability of the individual operator to respond to (MNZ, 2018).

The Department of Conservation (DOC) and GWRC have also been working together in recent years to create a system for assigning regional threat classification rankings to all of Wellington region's bird species, using New Zealand Threat Classification System (NZTCS) criteria that have been adapted to be applicable at a regional, rather than national scale (Rolfe *et al.* 2022; Crisp *et al.* 2024). To assign appropriate regional threat rankings to each bird species present in the Wellington region, estimates of both regional population size and population trend are applied to a set of pre-defined criteria to determine the correct threat ranking for each species (Rolfe *et al.* 2022). These regional threat classification rankings are now being increasingly used by GWRC to inform regional natural resource and indigenous habitat management priorities in the Wellington region, as they provide a more accurate representation of the regional threat status of a number of species which may be faring better or worse than they are at a national scale.

To discharge these various responsibilities and functions as efficiently and effectively as possible, GWRC needs to build and maintain a detailed and up-to-date understanding of the indigenous bird values of the Wellington region coastline, and the spatial distribution of those values. To help achieve this, GWRC carried out the first complete and systematic survey of the indigenous bird values of the Wellington region coastline during the summers of 2017 and 2018, to create a regional-scale baseline measure of the diversity, distribution and abundance of indigenous birds inhabiting Wellington region's coastline, against which future changes in distribution and population size can be measured (McArthur *et al.* 2019). A total of 69 bird species were detected during this survey, including 51 bird species (74%) were native or endemic to New Zealand, and 25 bird species (36%) are ranked as either Nationally Threatened or At Risk under the New Zealand Threat Classification System. The local species richness of threatened bird species tended to be highest in estuaries and along stretches of coastline adjacent to coastal lakes or with comparatively wide stretches of un-vegetated sand or gravel. Five new breeding sites for the Regionally Critical northern New Zealand dotterel (*Charadrius obscurus aquilonius*) were identified, extending the global breeding range of this taxon a further 45 km southwards, to a new global southern limit at the Pāhaoa River mouth. This survey also detected the first successful breeding attempt by this species on the west coast of the Wellington region in over 120 years (McArthur *et al.* 2019).

To maintain an up-to-date understanding of patterns in the diversity, abundance and distribution of coastal birds in the Wellington region, and to begin building estimates of the regional population

moving on a seasonal basis to exploit discontinuous (i.e. patchy) foraging and breeding resources and moving across rohe, takiwā, or territorial authorities' jurisdictions" (DOC, 2020).

trends of key coastal species, GWRC aims to repeat these regional coastal bird surveys at five-yearly intervals. To achieve this, GWRC commissioned a second complete and systematic survey of the indigenous bird values of the Wellington region coastline, which was carried out during the summers of 2022 and 2023. This report provides a summary of the results of this latest regional coastal bird survey, and reports on changes in bird distribution and abundance that have occurred since the first survey was carried out in 2017 and 2018. This report also provides a number of recommendations for how the information gained from this survey can be used to inform national and regional re-assessments of NZTCS threat rankings for coastal bird species; improve regional oiled wildlife response preparedness and contribute towards future plan changes to Wellington's Natural Resources Plan.

2. Methods

2.1 Survey area

Bird surveys were carried out along a total of 450 km of coastline in the Wellington region during the summers of 2022 and 2023. The mainland coastline was surveyed on foot, from Waikawa Beach on the northern Kāpiti coastline to the Owahanga River mouth on the northern Wairarapa coastline. In addition, the coastlines of Kāpiti, Motungarara, Tahoramaurea, Tokomapuna, Mana, Taputeranga, Mākaro/Ward, Matiu/Somes and Mokopuna Islands were surveyed by boat or by kayak. For logistical reasons, these surveys were split across two summer seasons, with the Wairarapa coast from the Owahanga River mouth to Ōnoke Spit being surveyed between the 22nd of January and the 2nd of February 2023, and the west Wellington coastline and inshore islands being surveyed between the 2nd of January and the 24th of March 2024 (Figure 2.1).

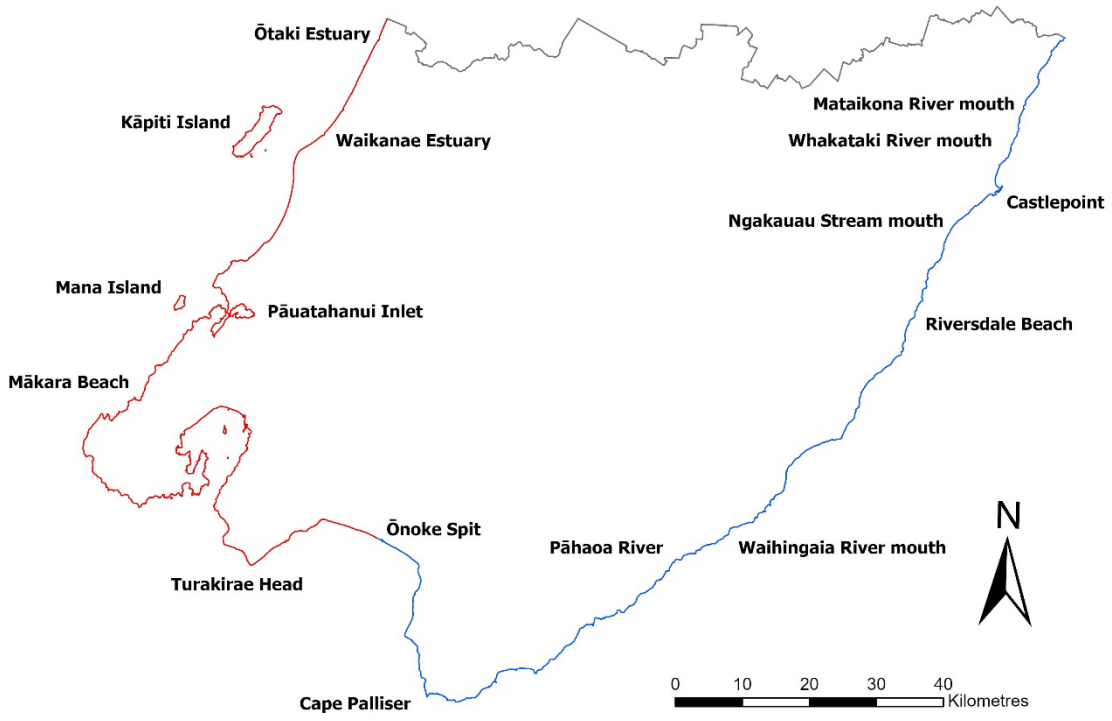


Figure 2.1: Extent of the Wellington region coastline surveyed in January-February 2023 (blue) and between January and March 2024 (red). The northern boundary of the Wellington region is marked in grey.

2.2 Field methods

This survey was carried out during the shorebird breeding season, at a time of year when the majority of many coastal-breeding shorebirds were occupying established breeding territories and were 'anchored' to active nests or broods of chicks. Carrying out these surveys at a time of year during which a number of these species were relatively sedentary therefore reduced the risk of double-counting birds that would be more likely to disperse over larger distances along the coastline in other seasons. All surveys were carried out during fine weather, and in relatively calm sea conditions.

When surveying the mainland coastline, a single observer walked along the foreshore, usually near the high tide mark, recording the identity and numbers of all birds and marine mammals seen or heard, including any birds or marine mammals 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 observer. Birds flying in the same direction that the observer was travelling in were not counted, to minimise the risk of double-counting birds. Special care was taken to systematically traverse or 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 in advance of the survey, and were aligned with Maritime New Zealand's Marine Oil Spill Risk Assessment Coast Cells (http://mosra18.navigatusconsulting.com/map, accessed 25/03/2025; Maritime New Zealand, unpublished data). In addition to compiling separate species lists for each 1 km section of shoreline traversed, individual checklists were compiled at a network of pre-defined estuaries and river mouths along the coast.

To survey the coastlines of the inshore islands, a single observer circumnavigated each island in a small, motorised boat at a speed of no greater than five knots (ca. 9 km/hr), recording the identity and numbers of all bird species seen and heard on the island or flying offshore. The survey vessel typically circumnavigated each island at a distance of less than 50 m from the shoreline, however this distance was occasionally extended to up to 200 m, in order to avoid navigational hazards such as submerged rocks. Separate counts were recorded either for each 1 km section of shoreline traversed (in the case of Kāpiti Island), or for arbitrarily defined sections of shoreline between two easily identified landmarks (in the cases of Mana, Matiu/Somes and Mokopuna Islands). For the remaining, smaller islands (namely Mākaro/Ward, Taputeranga, Motungarara, Tahoramaurea and Tokomapuna Islands), a single count was compiled for the entire island's coastline.

In addition to counting all birds that were detected, the locations of any active nests or nesting colonies, and any dependent chicks encountered along the coastline were also recorded using handheld GPS devices.

2.3 Data analysis

These survey data were entered twice into two separate Microsoft Excel™ worksheets for two-pass data verification. Data verification involved using a Microsoft Excel™ formula to compare cells in the two worksheets to identify any cells containing values that differed between the two duplicate worksheets, indicating possible data entry errors. Each differing pair of cells was then cross-checked against the corresponding field datasheet, and any data entry errors that were identified were corrected. The resulting verified dataset was then used to calculate total bird counts for individual survey sections and both total and mean counts for the entire region. These verified bird count data were also imported into ArcGIS Pro™, which was then used to construct the bird distribution maps included in this report.

A copy of the Microsoft Excel™ data spreadsheet containing these survey data, together with the original field datasheets, have been provided to Greater Wellington Regional Council. A copy of this dataset has also been uploaded to the New Zealand eBird database, an open-access bird observation database jointly maintained by Birds New Zealand and the Cornell Lab of Ornithology.

3. Results

3.1 Patterns and trends in species diversity and total abundance

Sixty-eight bird species and 21,397 individual birds were detected during the 2022-2023 survey of the Wellington region coastline (see Appendix One). This is very similar to the 69 bird species and 20,360 individual birds that were counted during the 2017-2018 survey (McArthur *et al.* 2019). A mean of 5.6 indigenous bird species were detected per 1 km survey section during the 2022-2023 survey, which was significantly higher than the mean of 4.9 indigenous bird species detected per survey section during the 2017-2018 survey ($F_{1,918}$ = 11.43; p = 0.0008; one-way ANOVA). In contrast, a mean count of 37.3 indigenous birds was recorded per 1 km survey section in 2022-2023, which was not significantly different from the mean count of 38.2 indigenous birds recorded per survey section in 2017-2018 ($F_{1,918}$ = 0.027; P = 0.869; one-way ANOVA). These results indicate that although there has been no regional-scale change in bird species diversity or total abundance along the Wellington region coastline since 2017, a number of indigenous bird species may have become more widespread over this time period.

Forty-nine (72%) of the 68 bird species detected during the 2022-2023 survey are indigenous to New Zealand and the remaining 19 species (28%) are introduced and naturalised species. This is very similar to the results of the 2017-2018 bird survey, during which 74% of the bird species detected were indigenous and 26% were introduced and naturalised.

Twenty-nine of the bird species detected (43%) are ranked as either Nationally Threatened or Nationally At Risk under the New Zealand Threat Classification System, including one species ranked as Nationally Endangered, three species ranked as Nationally Vulnerable, three species ranked as Nationally Increasing, ten species ranked as At Risk, Declining, five species ranked as At Risk, Relict, three species ranked as At Risk, Recovering and three species ranked as At Risk, Naturally Uncommon (Robertson *et al*., 2021; Table 3.1).

Twenty-five of the bird species detected (37%) are ranked as Regionally Threatened or Regionally At-Risk under the New Zealand Threat Classification System, including ten species ranked as Regionally Critical, seven species ranked as Regionally Endangered, six species ranked as Regionally Vulnerable and two species ranked as At Risk, Naturally Uncommon (Crisp *et al.,* 2024; Table 3.2).

Table 3.1: List of bird species detected during the 2022-2023 Wellington region coastal bird survey that are ranked as Nationally Threatened or Nationally At-Risk under the New Zealand Threat Classification System.

NZTCS national threat ranking	Species detected during this survey
National Endangered	Matuku moana / reef heron
Nationally Vulnerable	Pārera / grey duck, kawau tikitiki / spotted shag, taranui / Caspian tern
Nationally Increasing	Ngutu pare / wrybill, tūturiwhatu / NZ dotterel, kārearea / NZ falcon
At Risk, Declining	Kororā / little penguin, rako / Buller's shearwater, kuaka / bar-tailed godwit, tōrea / SI pied oystercatcher, pōhowera / banded dotterel, tarāpunga / red-billed gull, tarāpuka / black-billed gull, tara / white-fronted tern, koroātito / fernbird, pīhoihoi / NZ pipit
At Risk, Relict	Pakahā / fluttering shearwater, māpunga / black shag, kawaupaka / little shag, weka, kakariki / red-crowned parakeet
At Risk, Recovering	Pāngurunguru / Northern giant petrel, kāruhiruhi / pied shag, tōrea pango / variable oystercatcher
At Risk, Naturally Uncommon	Kawau tūī / little black shag, kotuku ngutupapa / royal spoonbill, black-fronted dotterel

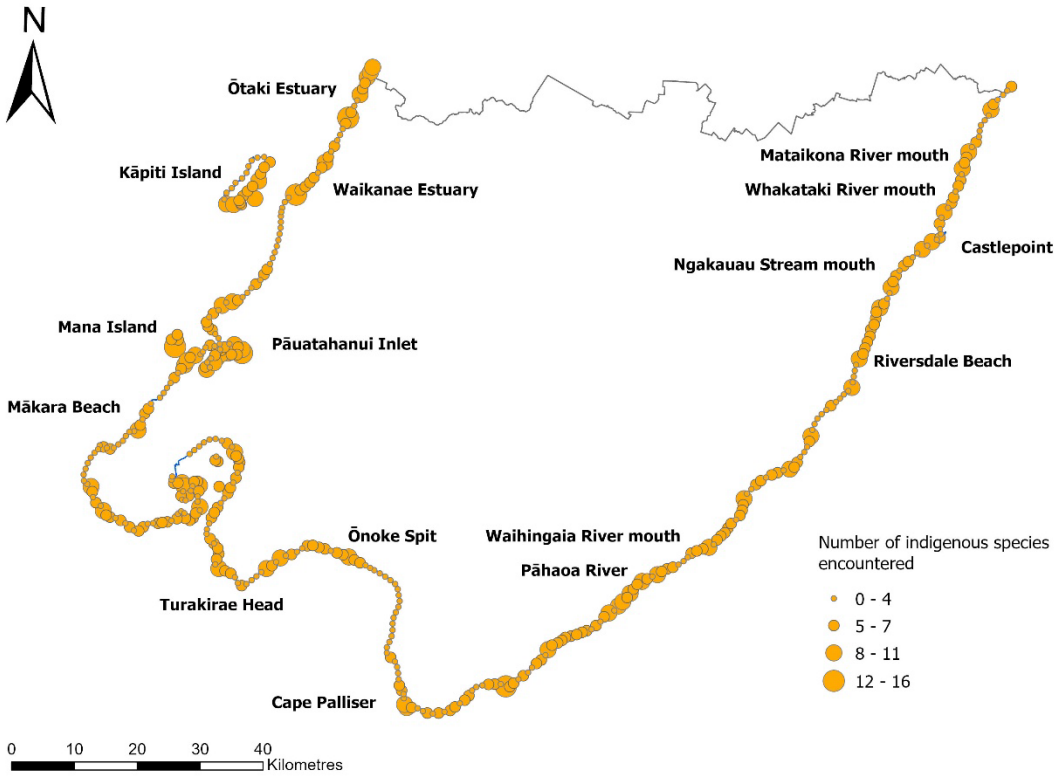
Table 3.2: List of bird species detected during the 2022-2023 Wellington region coastal bird survey that are ranked as Regionally Threatened or Regionally At-Risk under the New Zealand Threat Classification System.

NZTCS regional threat ranking	Species detected during this survey
Regionally Critical	Pārera / grey duck, pakahā / fluttering shearwater, matuku māpunga / black shag, kawau tikitiki / spotted shag, moana / reef heron, tūturiwhatu / NZ dotterel, ngutu pare / wrybill, kuaka / bar-tailed godwit, tarāpuka / black-billed gull, taranui / Caspian tern
Regionally Endangered	Kotuku ngutupapa / royal spoonbill, kawau paka / little shag, kawau tūī / little black shag, tōrea pango / variable oystercatcher, pohowera / banded dotterel, tara / white-fronted tern, pihoihoi / NZ pipit
Regionally Vulnerable	Kororā / little penguin, kāruhiruhi / pied shag, weka, tarāpunga / red-billed gull, kakariki / red-crowned parakeet, koroātito / fernbird
At Risk, Naturally Uncommon	Pāpango / NZ scaup, black-fronted dotterel

Both the local diversity and total abundance of indigenous birds varied considerably along the Wellington region coastline during both the 2017-2018 and 2022-2023 surveys (Figures 3.1 and 3.3). During both surveys, the larger estuaries and river mouths were hotspots of high species diversity and abundance, including sites such as the Waikanae and Ōtaki Estuaries, Pāuatahanui Inlet, and the Opouawe and Mataikona river mouths. The coastlines of Kāpiti, Mana and Matiu-Somes Islands, Ōnoke Spit and Castlepoint Lagoon were also regional hotspots of high species diversity and abundance. Stretches of the mainland coastline that possessed a heterogeneous mix of habitats including a mix of sandy or shingle beaches and intertidal rock platforms also supported a higher diversity and abundance of indigenous bird species, including the Wellington Harbour foreshore and the coastlines of Titahi Bay, Plimmerton, Tora and Castlepoint. In contrast, stretches of the mainland coastline that possessed homogenous stretches of uninterrupted sandy and shingle beaches, coastal cliffs and bluffs, or had been 'hardened' with coastal defences supported a relatively low diversity and total abundance of indigenous bird species (Figures 3.1 and 3.3).

Increases in the number of indigenous bird species were recorded in 238 (53%) out of 450 of the 1 km survey sections which were surveyed in both 2017-2018 and 2022-2023; and decreases in the number of indigenous species were recorded in 149 (33%) out of 450 survey sections. Local declines in species diversity were particularly concentrated around the coastlines of Kāpiti and Mana Islands, and along the Wairarapa coastline between Flat Point and the Pāhaoa River mouth (Figure 3.2).

Increases in the total abundance of indigenous birds were recorded in 22 (49%) out of 450 of the 1 km survey sections which were surveyed in both 2017-2018 and 2022-2023; and decreases in the total abundance of indigenous birds were recorded in 209 (46%) out of 450 survey sections. Local declines in the total abundance of indigenous birds appeared to be randomly distributed along the Wellington region coastline, but were particularly concentrated along the Wairarapa coastline between Flat Point and the Pāhaoa River (Figure 3.4).



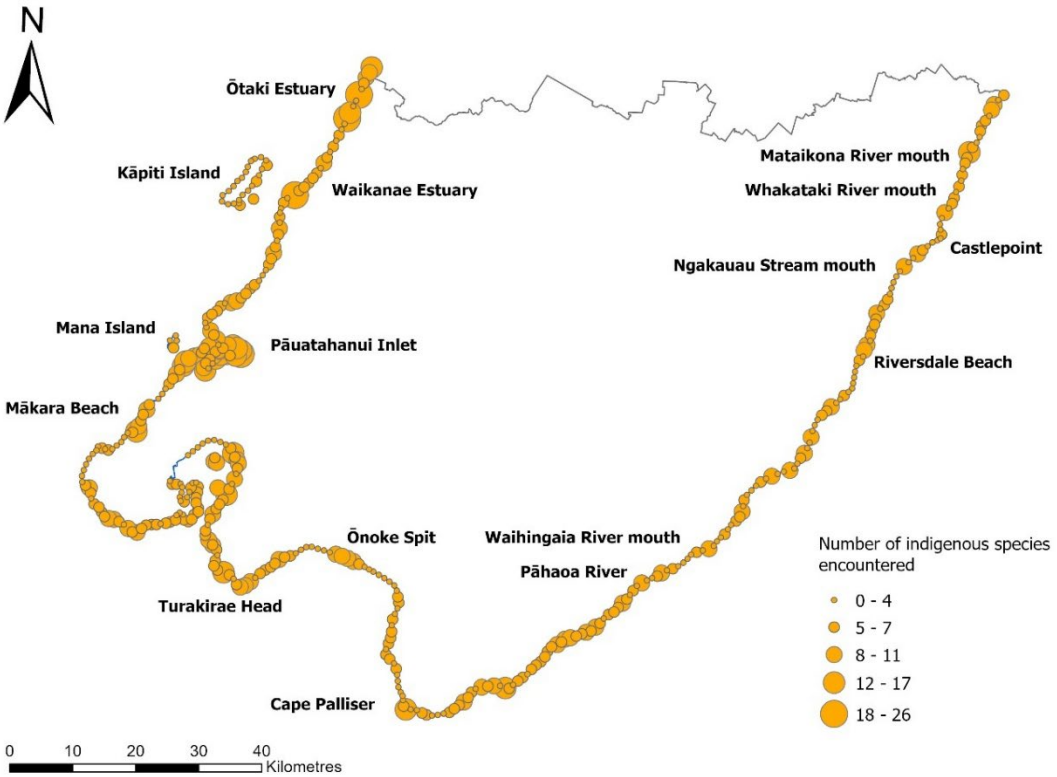


Figure 3.1: Spatial patterns in the number of indigenous bird species encountered per 1 km survey section along the Wellington region coastline in 2017-2018 (top map) and in 2022-2023 (bottom map).

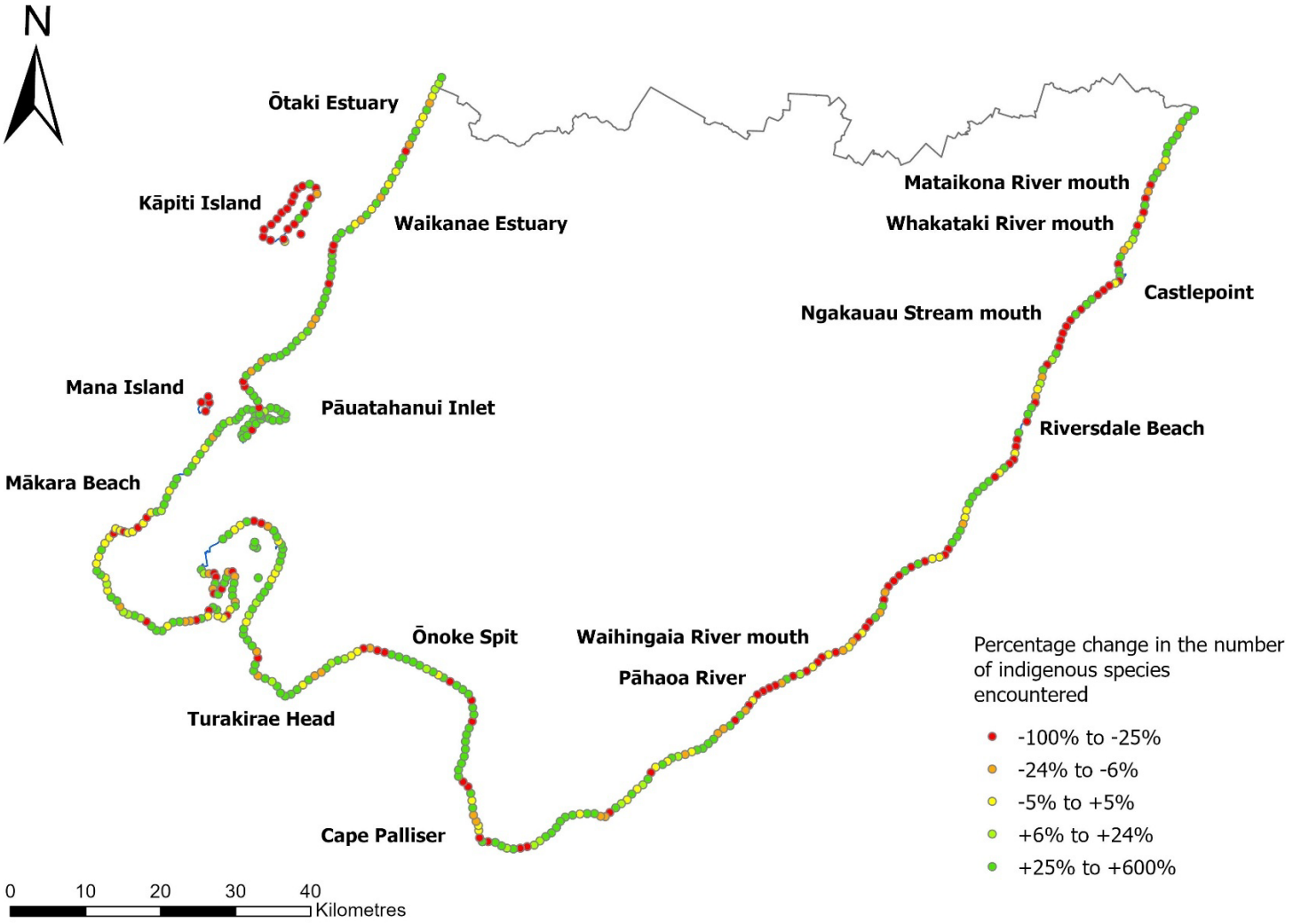


Figure 3.2: Percent change in the number of indigenous bird species encountered per 1 km survey section along the Wellington region coastline between 2017-2018 and 2022-2023.

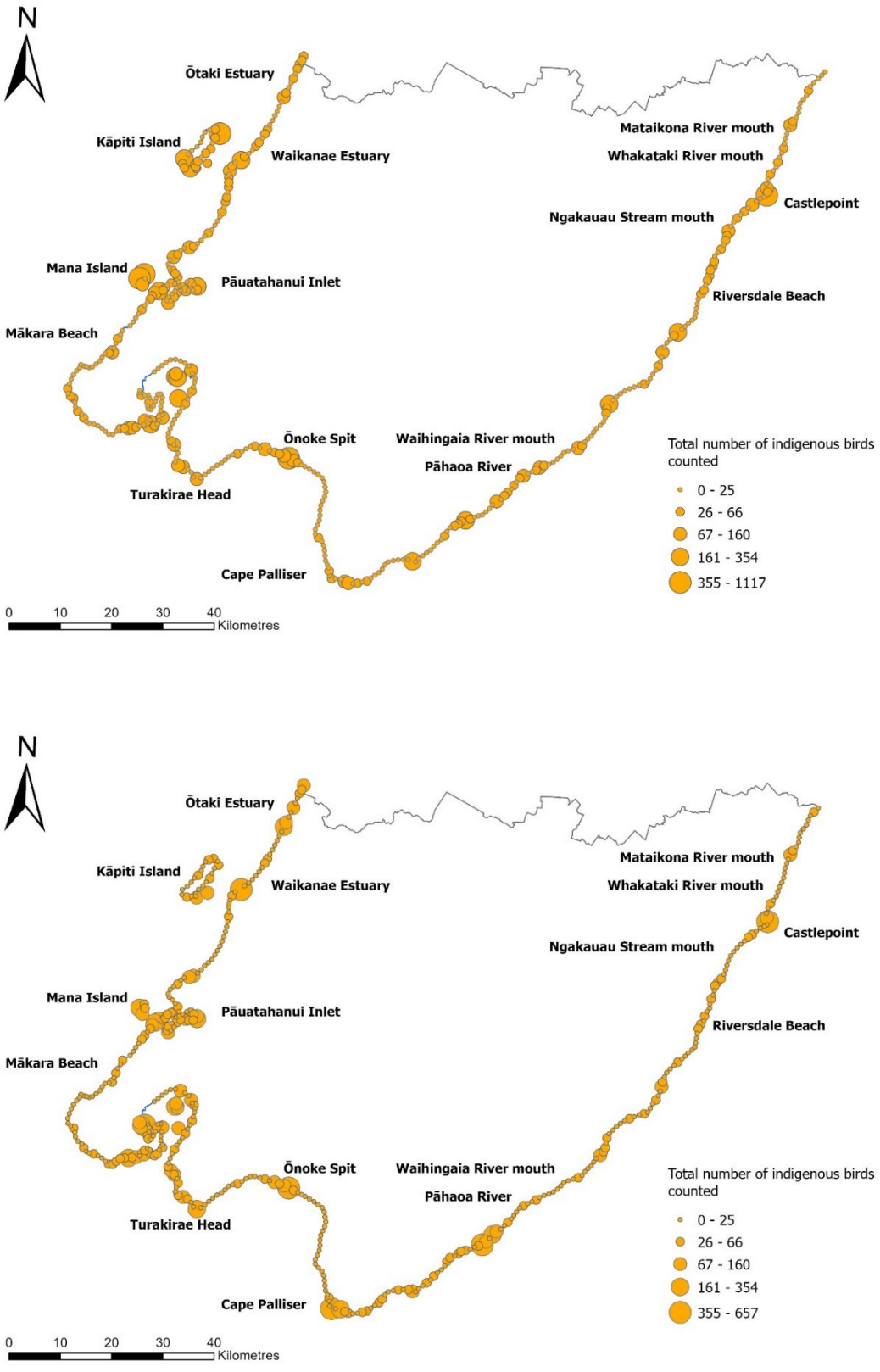


Figure 3.3: Spatial patterns in the total abundance of indigenous birds encountered per 1 km survey section along the Wellington region coastline in 2017-2018 (top map) and in 2022-2023 (bottom map).

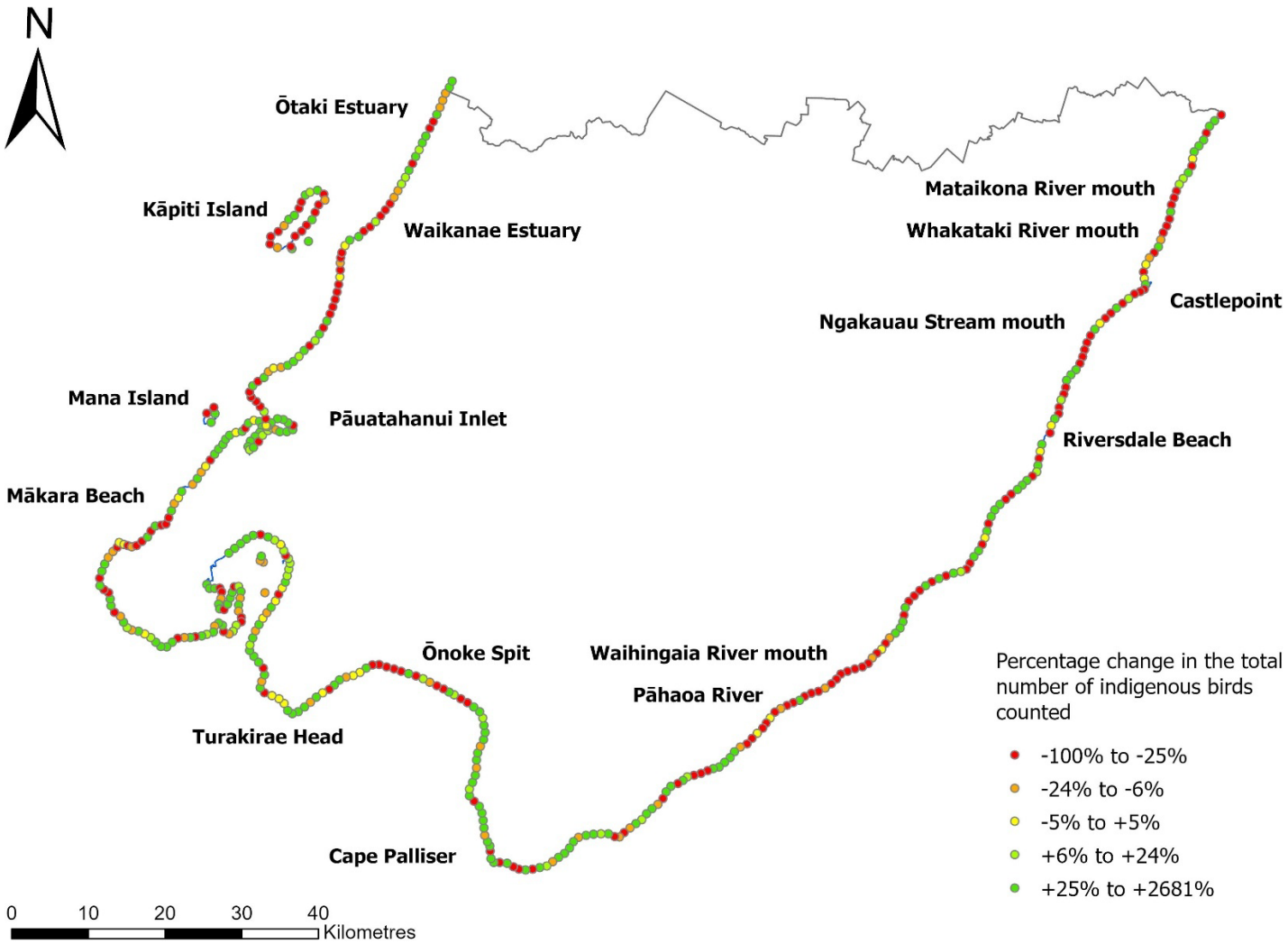


Figure 3.4: Percent change in the total abundance of indigenous birds encountered per 1 km survey section along the Wellington region coastline between 2017-2018 and 2022-2023.

Among the 53 estuaries and river mouths surveyed in 2023-2024, the Waikanae Estuary supported the highest diversity of indigenous birds with 26 species and 570 individuals counted. The Ōtaki Estuary also supported 26 species, with 319 individuals counted, and the Waitohu Estuary supported the second highest number of species, with 20 species and 75 individual birds counted (Table 3.3). There was little overall change in the species diversity rankings of individual estuaries and river mouths between the 2017-2018 and 2023-2024 surveys. Most of those sites with relatively high rankings during the 2017-2018 survey also had relatively high rankings during the 2023-2024 survey, with some exceptions. Among the 20 highest-ranked estuaries and river mouths during the 2023-2024 survey, The Oteranga Stream mouth had dropped 10 or more places from the 2017-2018 survey. In contrast, four estuaries had risen more than 10 places since 2017-2018, namely the Pāuatahanui Stream mouth (+ 10 places), Patanui Stream mouth (+11 places), Kakaho Stream mouth (+14 places), Whawanui Stream mouth (+23 places) and the Pāhaoa River mouth (+22 places). Among the 20 highest ranked estuaries and river mouths during the 2017-2018 survey, four estuaries dropped 10 or more places during the 2023-2024 survey, namely the Motuwaireka River mouth (-10 places), Hadfields Stream mouth (-10 places), Rerewhakaaitu River mouth (-13 places) and Whareroa Stream mouth (-10 places) (Table 3.3).

Table 3.3: List of estuaries and river mouths in the Wellington Region surveyed in 2022-2023, ranked in descending order according to the number of indigenous bird species encountered at each site. Numbers in parentheses represent the ranking, number of indigenous species and total number of indigenous birds counted during the 2017-2018 survey. Sites with values in parentheses missing were not surveyed in 2017-2018.

Rank	Site name	Number of indigenous species counted	Total number of indigenous birds counted
1 (1)	Waikanae Estuary	26 (24)	570 (225)
2 (2)	Ōtaki Estuary	26 (20)	319 (149)
3 (4)	Waitohu Estuary	20 (15)	75 (47)
4 (9)	Waikawa Estuary	19 (10)	120 (62)
5 (10)	Mākara Estuary	18 (10)	158 (148)
6 (5)	Hutt River Estuary	16 (13)	77 (102)
7 (19)	Pāuatahanui Stream	15 (8)	126 (12)
8 (6)	Wainuiomata River mouth	14 (12)	151 (146)
9 (15)	Mataikona River mouth	13 (8)	79 (70)
10 (14)	Porirua Stream mouth	12 (9)	117 (99)
11 (17)	Lake Kohangapiripiri outlet	11 (8)	108 (36)
12 (18)	Lake Kohangatera outlet	10 (8)	102 (45)
13 (3)	Oteranga Stream mouth	10 (17)	38 (55)
14 (25)	Patanui Stream mouth	10 (5)	33 (224)
15 (29)	Kakaho Stream mouth	10 (5)	30 (8)
16 (8)	Opouawe River mouth	9 (10)	64 (221)

Rank	Site name	Number of indigenous species counted	Total number of indigenous birds counted
17 (16)	Whakataki River mouth	9 (8)	51 (53)
18 (41)	Whawanui River mouth	9 (3)	24 (5)
19	Duck Creek outlet	9	20
20 (42)	Pāhaoa Estuary	9 (3)	16 (12)
21 (11)	Motuwaireka River mouth	8 (9)	36 (42)
22 (47)	Arawhata Stream mouth	8 (2)	35 (8)
23 (13)	Hadfields Stream mouth	8 (9)	17 (12)
24 (32)	Whareama River mouth	8 (4)	14 (14)
25 (12)	Rerewhakaaitu River mouth	7 (9)	30 (30)
26 (30)	Waimeha Stream mouth	7 (5)	23 (10)
27 (36)	Wharemauka Stream mouth	7 (4)	22 (13)
28 (52)	Horokiri Stream mouth	7 (2)	21 (2)
29 (43)	Otahome Stream mouth	7 (3)	17 (5)
30 (20)	Whareroa Stream mouth	7 (7)	11 (7)
31 (26)	Kaiwhata River mouth	6 (5)	70 (16)
32 (22)	Waihingaia Stream mouth	6 (6)	23 (19)
33 (33)	Okau Stream mouth	6 (4)	12 (15)
34 (45)	Orongorongo River mouth	6 (3)	12 (8)
35 (39)	Awhea River mouth	6 (3)	11 (6)
36 (35)	Wainui Stream mouth	6 (4)	9 (6)
37	Castlepoint Lagoon	5	381
38 (40)	Oterei River mouth	5 (3)	21 (12)
39 (27)	Mukamuka Stream mouth	5 (5)	16 (14)
40 (54)	Waioronu Stream mouth	5 (1)	9 (4)
41 (7)	Ngakauau Stream mouth	4 (11)	25 (69)
42 (31)	Otakaha Stream mouth	4 (4)	16 (7)
43 (46)	Waikaraka Stream mouth	4 (2)	8 (30)
44 (21)	Mukamukaiti Stream mouth	4 (7)	7 (11)
45 (37)	Wharepapa River mouth	3 (4)	58 (20)
46 (44)	Tikotu Creek outlet	3 (3)	15 (18)
47 (53)	Wharekauhau Stream mouth	3 (2)	8 (3)
48 (55)	Mangaone Stream mouth	3 (0)	4 (0)
49 (24)	Pararaki Stream mouth	2 (5)	18 (58)
50 (48)	Korokoro Stream mouth	2 (2)	4 (3)
51 (51)	Taupo Stream mouth	2 (2)	3 (8)
52 (23)	Corner Creek outlet	1 (6)	1 (6)
53	Waimimi Stream mouth	0	0

3.2 Patterns and trends in species abundance

In the following sections of the report, we have mapped spatial patterns in the abundance of 14 of the 49 indigenous bird species that were detected along the Wellington region coastline during the 2017-2018 and 2022-2023 surveys. These species have been chosen either because they are entirely restricted to coastal habitats (e.g., tūturiwhatu / New Zealand dotterel and matuku moana / reef heron), or because these coastal survey data can be combined with other regional-scale datasets (e.g., pohowera / banded dotterel) to estimate the total regional population size and map the regional distribution of these species. Summary statistics describing the abundance and distribution of the remaining 32 indigenous bird species encountered during these two surveys can be found in the Appendix.

3.2.1 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 total of 258 adult pohowera / banded dotterels were counted during the 2022-2023 survey, occupying 42 (10%) of the 450 1 km sections of coastline and associated estuaries and coastal lagoons surveyed. This represents a 25% decline from the 346 adult pohowera / banded dotterels counted during the 2017-2018 survey, during which this species was found to be occupying 58 (13%) of the 450 sections of coastline surveyed (Figure 3.5; McArthur *et al.* 2019). Among the sections of coastline that were surveyed during both the 2017-2018 and 2022-2023 surveys, the mean number of pōhowera / banded dotterels counted per survey section declined from 0.77 birds per section in 2017-2018 to 0.57 birds per section in 2022-2023. This 26% decline in the mean number of pohowera / banded dotterels counted per section was not statistically significant however ($F_{1,898}$ = 1.35; P = 0.25; one-way ANOVA), likely due to the low proportion of survey sections occupied by pohowera / banded dotterels and the high variation in the number of adult birds encountered in each occupied survey section.

During both the 2017-2018 and 2022-2023 surveys, pohowera / banded dotterels were not uniformly distributed along the coastline. Instead, most birds were clustered at estuaries and river mouths, and along short sections of relatively wide shingle or sandy beaches (Figure 3.5). This highly clustered distribution appears to be a consequence of the preference of pohowera / banded dotterels for breeding on sections of coastline that have comparatively wide expanses of unvegetated gravel or sand, a pattern which has been observed on coastlines elsewhere in New Zealand (McArthur *et al.* 2019; McArthur *et al.* 2024). Local declines in the abundance of pohwera / banded dotterels were recorded in a large proportion of the 1 km survey sections in which this species had been encountered during the 2017-2018 survey, and these declines have not been offset by corresponding increases elsewhere along the Wellington region coastline (Figure 3.6). This pattern indicates that there has

been a widespread, regional-scale decline in the number of adult pohowera / banded dotterels breeding along the Wellington region coastline since 2017.

In 2017-2018 it was estimated that the Wellington region supported a breeding population of 728 adult pohowera / banded dotterels, comprising 382 birds breeding on the region's rivers and 346 birds breeding along the Wellington region coastline (McArthur *et al.* 2019). A more recent series of river surveys carried out between 2021-2023 has since indicated that the number of pōhowera / banded dotterels breeding on the region's rivers has fallen to 314 birds, representing an 18% decline in the number of birds breeding on the Wellington region's rivers since 2017 (McArthur, 2022; GWRC, unpublished data). By combining the results of this 2022-2023 coastal survey with these 2021-2023 river survey data, it is estimated that the Wellington region currently supports a breeding population of 572 adult pōhowera / banded dotterels, a 21% decline from the 728 birds counted in 2017-2018. The national (and global) pohowera / banded dotterel population is currently estimated to be around 19,000 birds (Hansen *et al.* 2016). This being the case, the 21% decline in the Wellington region breeding population would equate to a 0.8% decline in the national and global breeding population of this species.

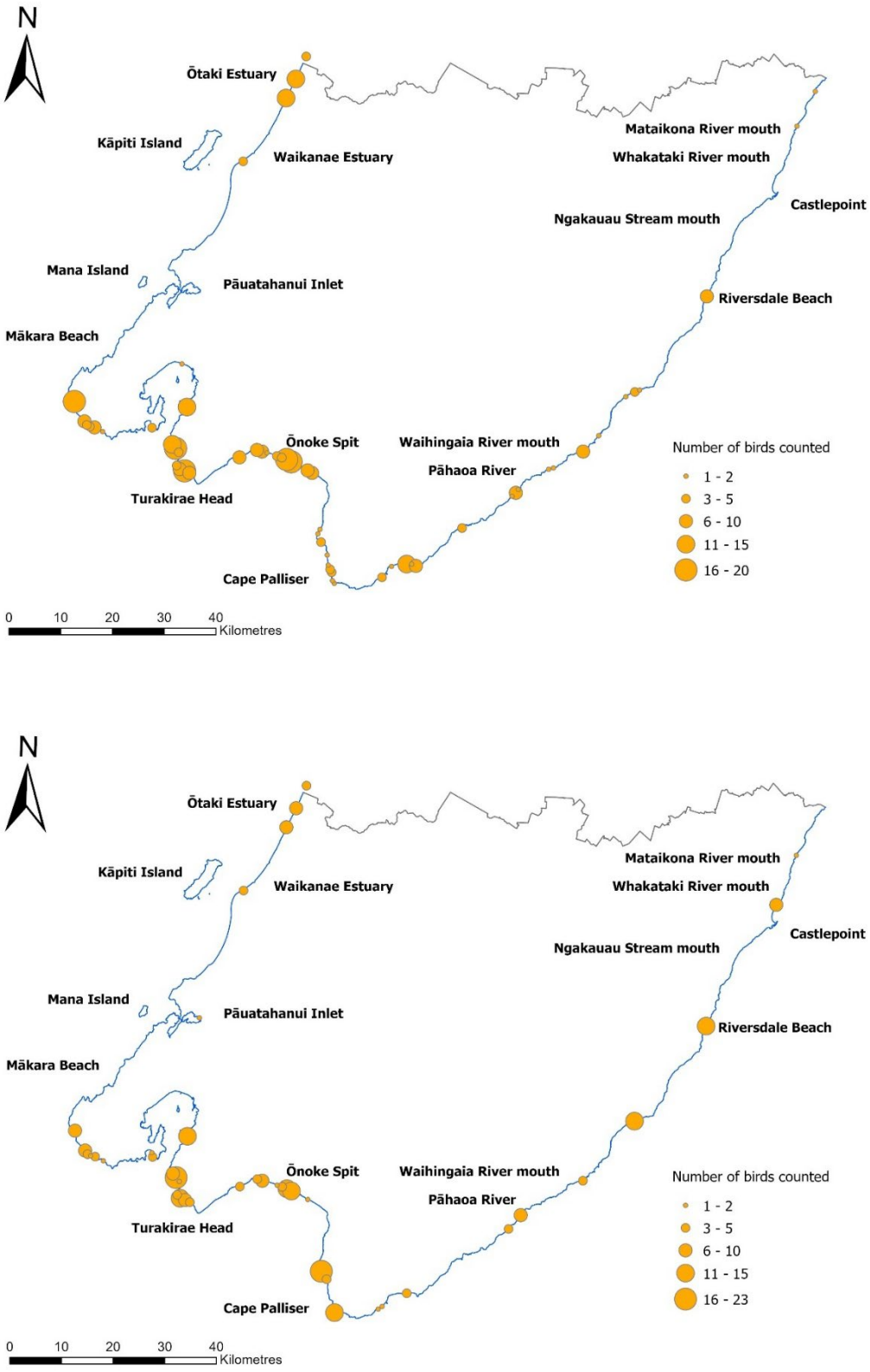


Figure 3.5: Spatial patterns in the local abundance of pohowera / banded dotterels per 1 km survey section along the Wellington region coastline in 2017-2018 (top map) and in 2022-2023 (bottom map).

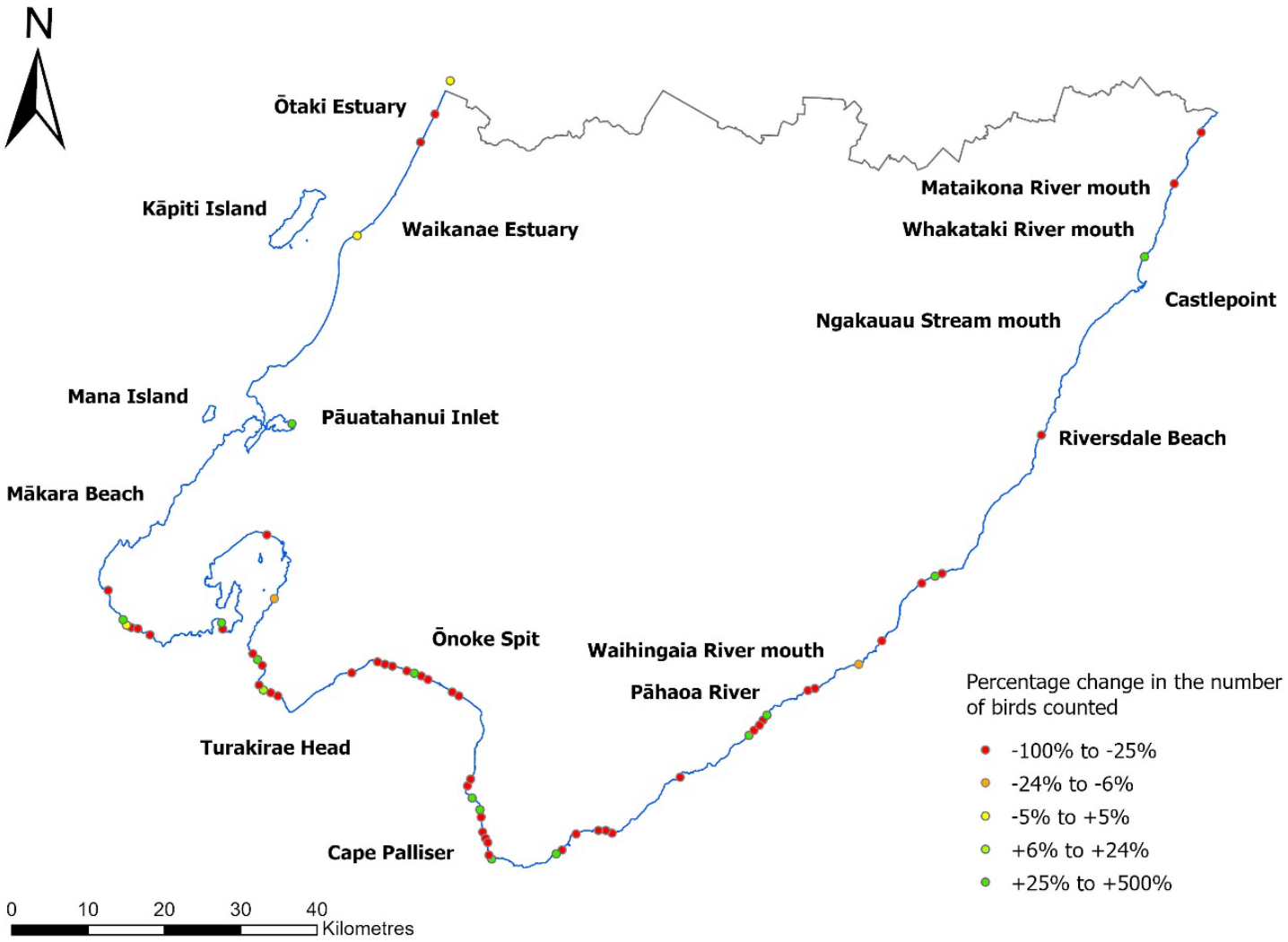


Figure 3.6: Percent change in the local abundance of pohowera / banded dotterels per 1 km survey section along the Wellington region coastline between 2017-2018 and 2022-2023.

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 total of 173 adult māpunga / black shags were counted during the 2022-2023 coastal bird survey, occupying 83 (18%) of the 450 1 km sections of coastline and associated estuaries and coastal lagoons surveyed. This represents a 17% increase from the 148 adult māpunga / black shags counted during the 2017-2018 survey, during which this species was found to be occupying 78 (17%) of the 450 sections of coastline surveyed (Figure 3.7). Among the sections of coastline that were surveyed during both the 2017-2018 and 2022-2023 surveys, the mean number of māpunga / black shags counted per survey section increased from 0.33 birds per section to 0.38 birds per section. This 15% increase in the mean number of māpunga / black shags counted per section was not statistically significant however ($F_{1,898}$ = 0.62; P = 0.43; one-way ANOVA), likely due to the high level of variation between individual section counts and the low proportion of survey sections occupied by māpunga / black shags.

During both surveys, māpunga / black shags were very scarce and sparsely distributed along coastline to the west of Cape Palliser but were considerably more common and widespread along the eastern Wairarapa coastline (Figure 3.7). Local 'hotspots' of abundance at the Ngakauau, Waihingaia and Pāhaoa River mouths may suggest the presence of previously unknown breeding colonies near these three locations. The coastal distribution of māpunga / black shags and kāruhiruhi / pied shags (Figure 3.19) in the Wellington region appears to be almost mutually exclusive, suggesting that some form of competitive exclusion may be occurring between these two species, with kāruhiruhi / pied shags being the more dominant of the two. It's possible therefore that as the distribution of pied shags continues to expand eastwards, māpunga / black shags may become increasingly scarce along the Wairarapa coastline. That said, local declines in the abundance of māpunga / black shags that have occurred between 2017-2018 and 2022-2023 within individual 1 km survey sections appeared to be randomly distributed along the Wellington region coastline, and these local declines were largely offset by local increases in abundance in nearby survey sections (Figure 3.8).

Māpunga / black shags not only occur along the Wellington region coastline but also occupy inland freshwater habitats such as rivers and lakes. For this reason, no accurate estimate exists for the size of the Wellington region's māpunga / black shag population. Recent counts that have been carried out at all known māpunga black shag breeding colonies suggests that there is likely to be no greater than 250 breeding pairs in the Wellington region, and somewhere between 250-1000 adult birds in total (Birds New Zealand, unpublished data; GWRC/DOC, unpublished data).

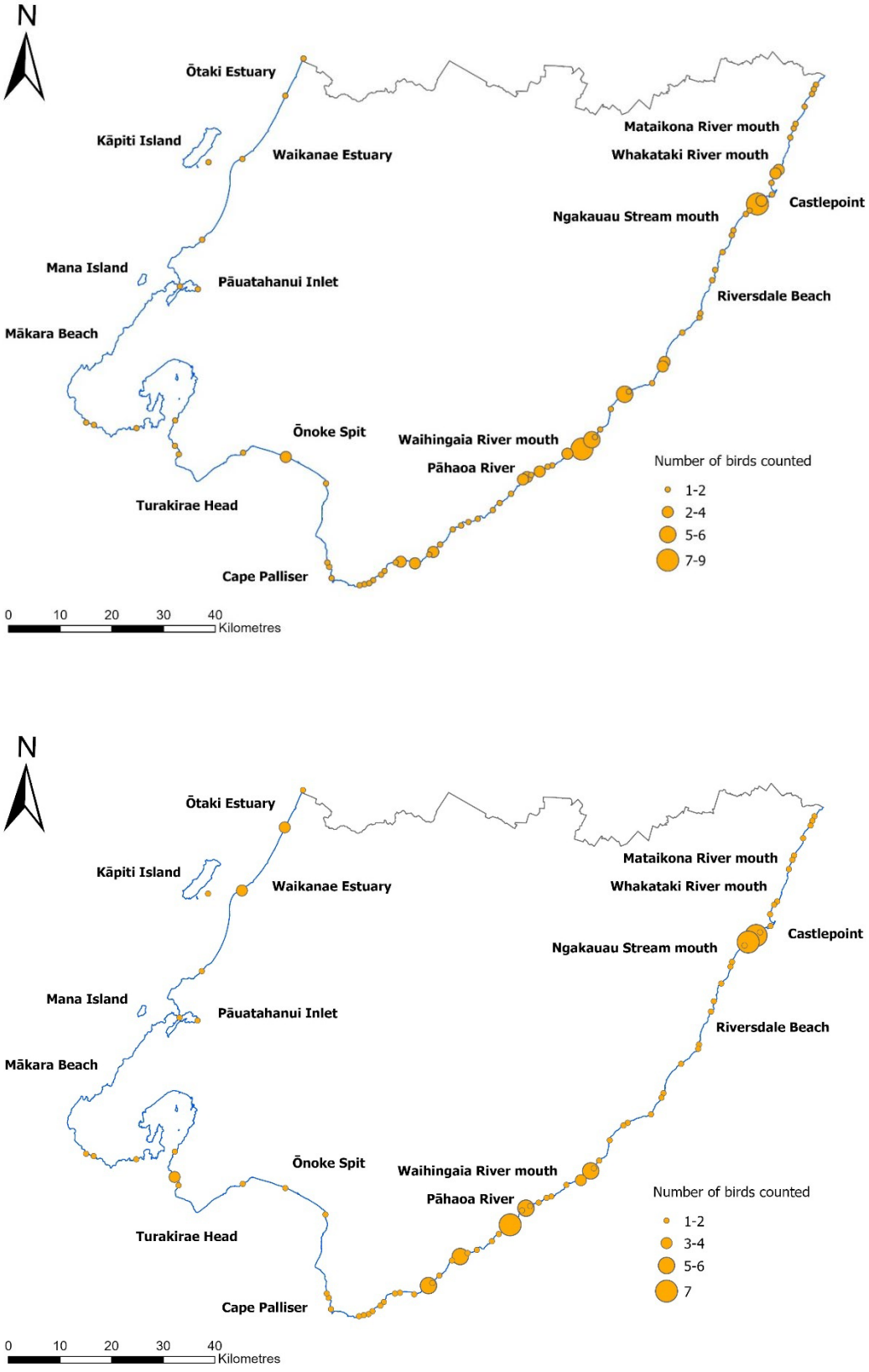


Figure 3.7: Spatial patterns in the local abundance of māpunga / black shags per 1 km survey section along the Wellington region coastline in 2017-2018 (top map) and in 2022-2023 (bottom map).

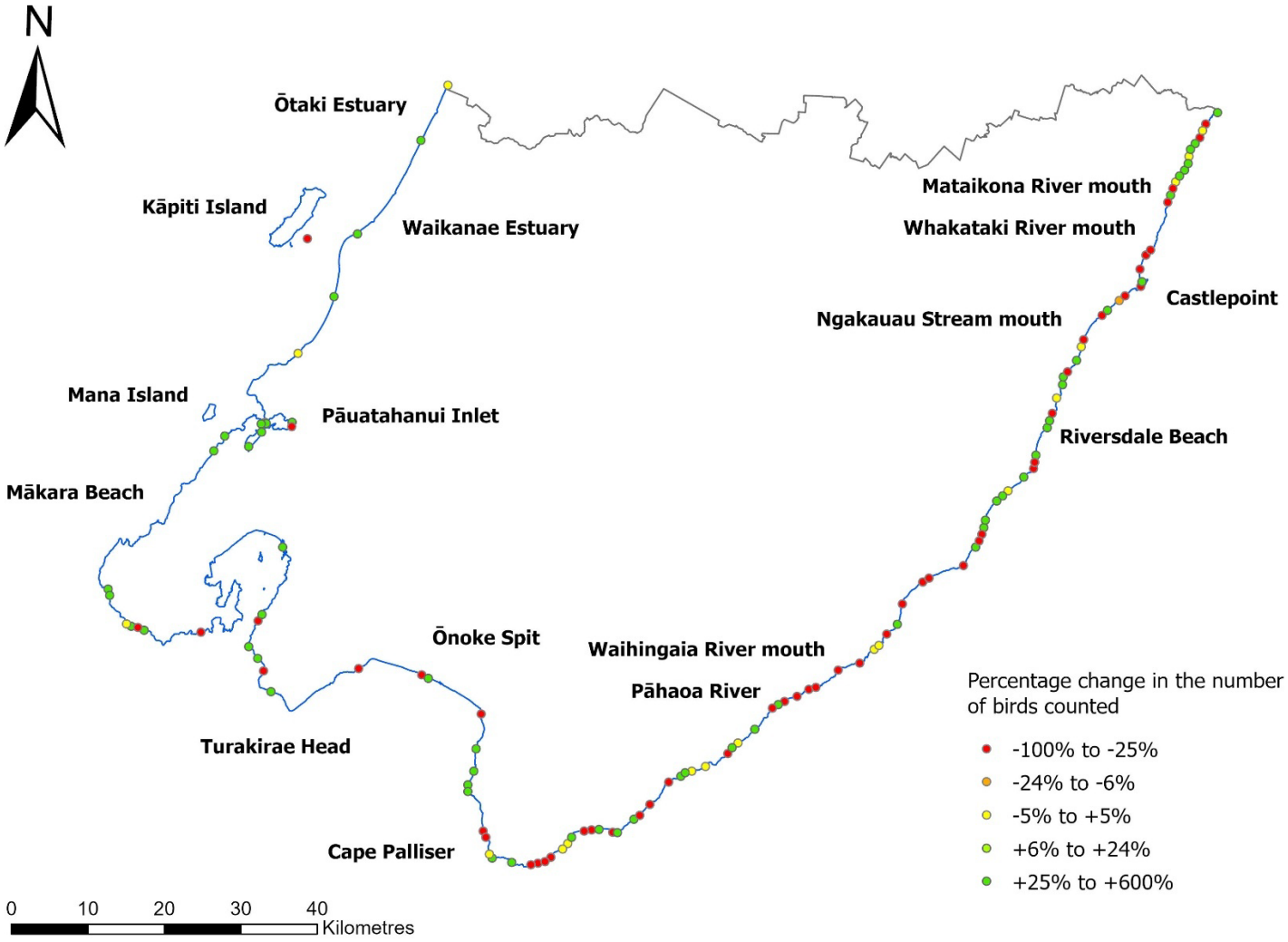


Figure 3.8: Percent change in the local abundance of māpunga / black shags per 1 km survey section along the Wellington region coastline between 2017-2018 and 2022-2023.

3.2.3 Black-fronted dotterel (*Charadrius melanops*)

Image courtesy of Neil Fitzgerald/NZ Birds Online

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

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

Forty-two adult black-fronted dotterels were counted during the 2022-2023 survey, occupying 21 (4.6%) of the 450 1 km sections of coastline and associated estuaries and coastal lagoons surveyed. This represents a 425% increase from the eight adult black-fronted dotterels counted during the 2017-2018 survey, during which this species was found to be occupying four (0.9%) of the 450 sections of coastline surveyed (Figure 3.9; McArthur *et al.* 2019). Among the sections of coastline that were surveyed during both the 2017-2018 and 2022-2023 surveys, the mean number of black-fronted dotterels counted per survey section increased from 0.02 birds per section in 2017-2018 to 0.09 birds per section in 2022-2023. This 350% increase in the mean number of black-fronted dotterels counted per section was statistically significant ($F_{1,898}$ = 8.48; P = 0.004; one-way ANOVA), indicating that this represents a real increase in the mean abundance of black-fronted dotterels along the Wellington region coastline, rather than being a consequence of sampling error.

During both the 2017-2018 and 2022-2023 surveys, black-fronted dotterels were sparsely distributed along the Wellington region coastline, and tended to be highly clustered at estuaries, river mouths and coastal lagoons. There was a noticeable increase in the number of birds recorded along the eastern Wairarapa coastline between 2017-2018 and 2022-2023 (Figure 3.10). These local increases in black-fronted dotterel numbers coincided with a concurrent decline in the number of black-fronted dotterels occupying riverbed habitats in the Wairarapa. In January 2017, a total of 514 adult black-fronted dotterels were counted along 211 km of riverbed habitat in the Wairarapa, but in December 2022 only 433 birds were counted along the same stretches of river, representing a decline of 16% (McArthur & Burgin, 2017; GWRC, unpublished data). Recent flooding in the Wairarapa has been identified as one of the most likely factors explaining substantial declines in shorebird numbers on Wairarapa rivers since 2017 (McArthur & Thomas, 2024). On 11-12 July 2022 an atmospheric river of moisture brought heavy rain and strong winds to large parts of the North Island, including the Wairarapa[2]. Widespread flooding occurred across the Wairarapa, with the Ruamāhanga River at Wardell's Bridge experiencing a peak flow of 656 cumecs at 6.50pm on the 12th of July[3,4]. Widespread evidence of severe habitat disturbance caused by this recent flooding was observed during the December 2022 river bird survey, including large accumulations of flood debris on riverbanks several

[2] https://niwa.co.nz/sites/niwa.co.nz/files/Climate_Summary_July_2022_Final-v3.pdf; accessed 16/06/2023.
[3] http://graphs.gw.govt.nz/; accessed 16/06/2023.
[4] To provide some context illustrating the magnitude of this flood event, the mean annual flow recorded at this site during 2022 was 31.08 cumecs (https://graphs.gw.govt.nz/envmon?view=site-statistics&collection=River+and+Stream+Levels&site=Ruamahanga+River+at+Wardells&measurement=Flow&flow=Measured+Flow; accessed 3/10/2024).

metres above the active riverbed, deep deposits of freshly eroded gravels and rocks on the riverbed and substantial undercutting of riverbanks and scouring of the riverbed. This substantial and widespread disturbance of riverbed habitats in the Ruamāhanga and Opouawe River catchments may have reduced habitat quality for riverbed-nesting shorebirds by reducing food availability and destroying or altering nesting habitats, thus explaining the decline in shorebird numbers observed between the 2017 and 2022 river bird surveys. This habitat disturbance may also explain the local increases in the number of black-fronted dotterels observed along the Wairarapa coastline during the 2022-2023 coastal bird survey, as these may represent birds that have relocated from nearby riverine habitats in response to local reductions in habitat quality due to flooding.

In 2017 it was estimated that the Wellington region supported a breeding population of at least 514 adult black-fronted dotterels, the vast majority of which were occupying riverbed habitats in the Wairarapa (McArthur & Burgin 2017). A more recent series of river surveys carried out between 2021-2023 has since indicated that the number of black-fronted dotterels breeding on the region's rivers has fallen to 447 birds (McArthur & Thomas, 2022; GWRC, unpublished data). By combining the results of this 2022-2023 coastal survey with these 2021-2023 river survey data, it is estimated that the Wellington region currently supports a breeding population of 489 adult black-fronted dotterels, representing a 5% decline from the 514 birds counted in 2017-2018. This is the first population decline to be observed in the Wellington region black-fronted dotterel population since this species first colonised the region in 1966 (Heather 1973; McArthur & Burgin, 2017).

McArthur *et al.* (2022) estimated that 2480 - 2850 black-fronted dotterels currently occur in New Zealand, which represents an upwards revision of the estimate of 2000 birds reported by Heather & Robertson (2015). Taking into account recent survey results from Hawke's Bay, the Manawatū-Whanganui region and the more recent river and coastal bird surveys carried out in the Wellington region between 2021 and 2023, we now estimate that the national black-fronted dotterel population to be 2,443 – 2,813 birds. This being the case, the 489 black-fronted dotterels present in the Wellington region represents 17-20% of the national population of this species.

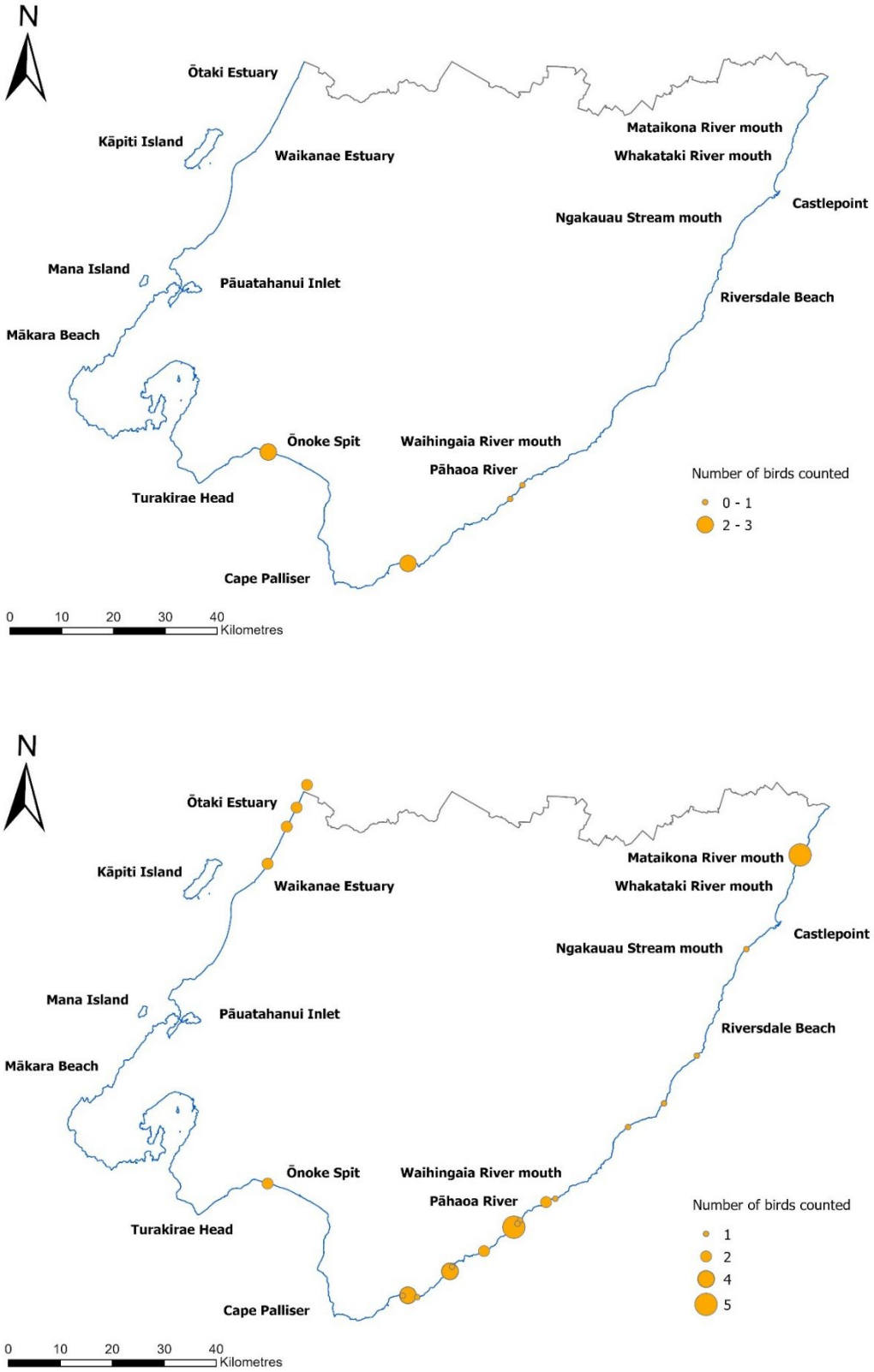


Figure 3.9: Spatial patterns in the local abundance of black-fronted dotterels per 1 km survey section along the Wellington region coastline in 2017-2018 (top map) and in 2022-2023 (bottom map).

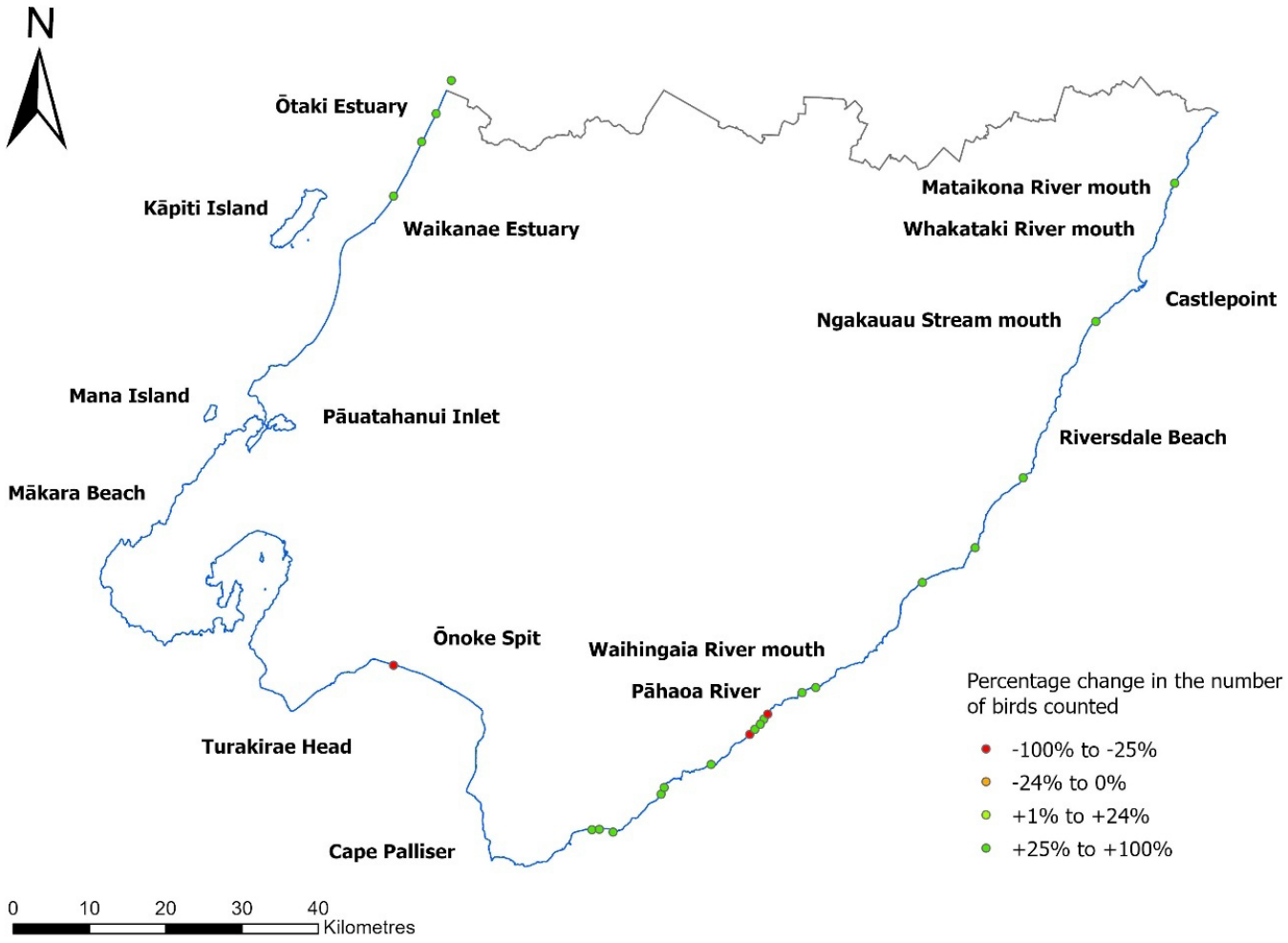


Figure 3.10: Percent change in the local abundance of black-fronted dotterels per 1 km survey section along the Wellington region coastline between 2017-2018 and 2022-2023.

3.2.4 Taranui / Caspian tern (*Hydroprogne caspia*)

Image courtesy of Les Feasey/NZ Birds Online

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

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

A total of 55 adult taranui / Caspian terns were counted during the 2022-2023 survey, occupying 43 (9.5%) of the 450 1 km sections of coastline and associated estuaries and coastal lagoons surveyed. This represents a 22% increase from the 45 adult taranui / Caspian terns counted during the 2017-2018 survey, during which this species was found to be occupying 30 (6.6%) of the 450 sections of coastline surveyed (Figure 3.11; McArthur *et al.* 2019). Among the sections of coastline that were surveyed during both the 2017-2018 and 2022-2023 surveys, the mean number of taranui / Caspian terns counted per survey section increased from 0.10 birds per section in 2017-2018 to 0.12 birds per section in 2022-2023. This 20% increase in the mean number of taranui / Caspian terns counted per section was not statistically significant however ($F_{1,898}$ = 0.54; P = 0.46; one-way ANOVA), likely due to the low proportion of survey sections occupied by taranui / Caspian terns and the variation in the number of adult birds encountered in each occupied survey section.

During both surveys, taranui / Caspian terns were sparsely distributed along the entire length of the Wellington region coastline, with local hotspots of abundance occurring at estuaries, river mouths and coastal lagoons where these birds congregate to roost. These sites include the Waikanae Estuary, Ōnoke Spit, Riversdale Beach and the Ngakauau Stream mouth (Figure 3.11). Local declines in the abundance of taranui / Caspian terns within individual 1 km survey sections appeared to be randomly distributed along the Wellington region coastline, and these local declines were largely offset by local increases in abundance in nearby survey sections (Figure 3.12).

Taranui / Caspian terns are a highly mobile and cosmopolitan species that is sparsely distributed throughout Eurasia, Africa, Australasia and North and Central America (Higgins & Davies, 1996). In New Zealand, taranui / Caspian terns are widespread around the mainland coastline, and are regularly encountered well inland on larger rivers, lakes and hydroelectric dams (Heather & Robertson, 2015; eBird, 2025). Taranui / Caspian terns have nested on Ōnoke Spit since at least 1936, the only location in the Wellington region where this species is known to have successfully bred[5]. This colony experienced a slow increase in size from around 30 breeding pairs in the late 1930s to a maximum count of 60 breeding pairs in 1972. Around 1975 the number of breeding pairs in the colony dropped sharply to around 30 pairs and then continued to fluctuate between 26 and 38 breeding pairs between 1976 and 1996 (Challies & Scadden, 2010). In more recent years, the number of breeding pairs has dropped even further, with only 17 breeding pairs present during the 2018-2019 breeding season

[5] In December 2018, this Ōnoke Spit colony relocated to Wairongomai River delta on the western shoreline of Lake Wairarapa where a number of clutches of eggs were laid. This nesting colony failed quickly due to disturbance by quad bikes, and these adult birds relocated back to Ōnoke Spit for the remainder of the season (Joanna McVeagh, *personal communication*).

(eBird, 2025). The colony appears to have experienced very poor productivity since at least 2013, likely due to the combined impacts of human disturbance, and depredation by cats (*Felis catus*) and black-backed gulls (McArthur, 2020). No breeding activity appears to have been observed at this site since the 2018-2019 breeding season, indicating that this breeding colony may now no longer exist (eBird, 2025).

Given that taranui / Caspian terns are a highly mobile bird species capable of dispersing large distances, the 22% increase in the number of birds counted between the 2017-2018 and 2022-2023 coastal bird surveys may either be due to an increase in the rate at which birds have been double-counted on successive survey days, or an increase in the number of birds dispersing into the Wellington region from breeding colonies elsewhere in the country.

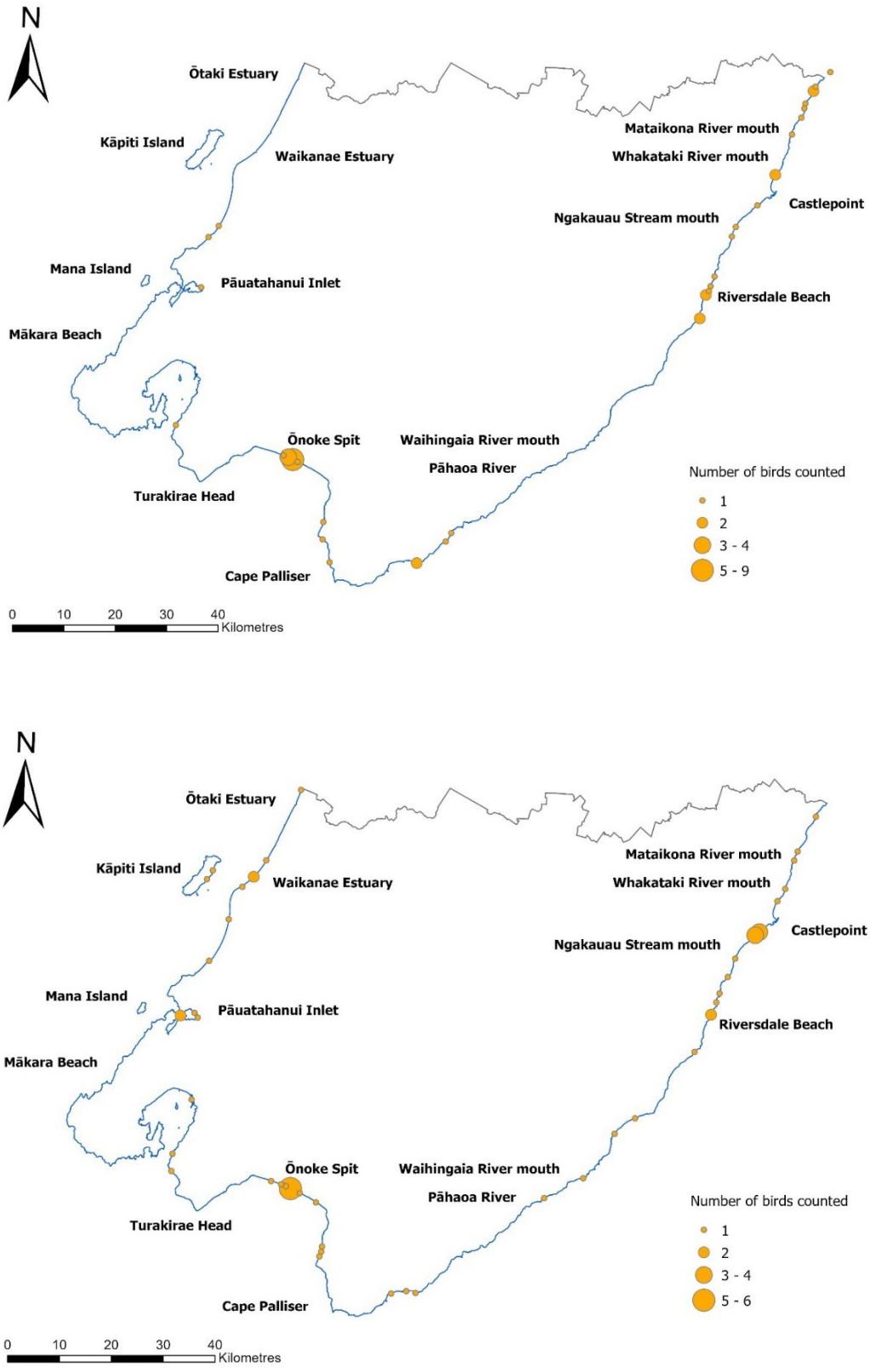


Figure 3.11: Spatial patterns in the local abundance of taranui / Caspian terns per 1 km survey section along the Wellington region coastline in 2017-2018 (top map) and in 2022-2023 (bottom map).

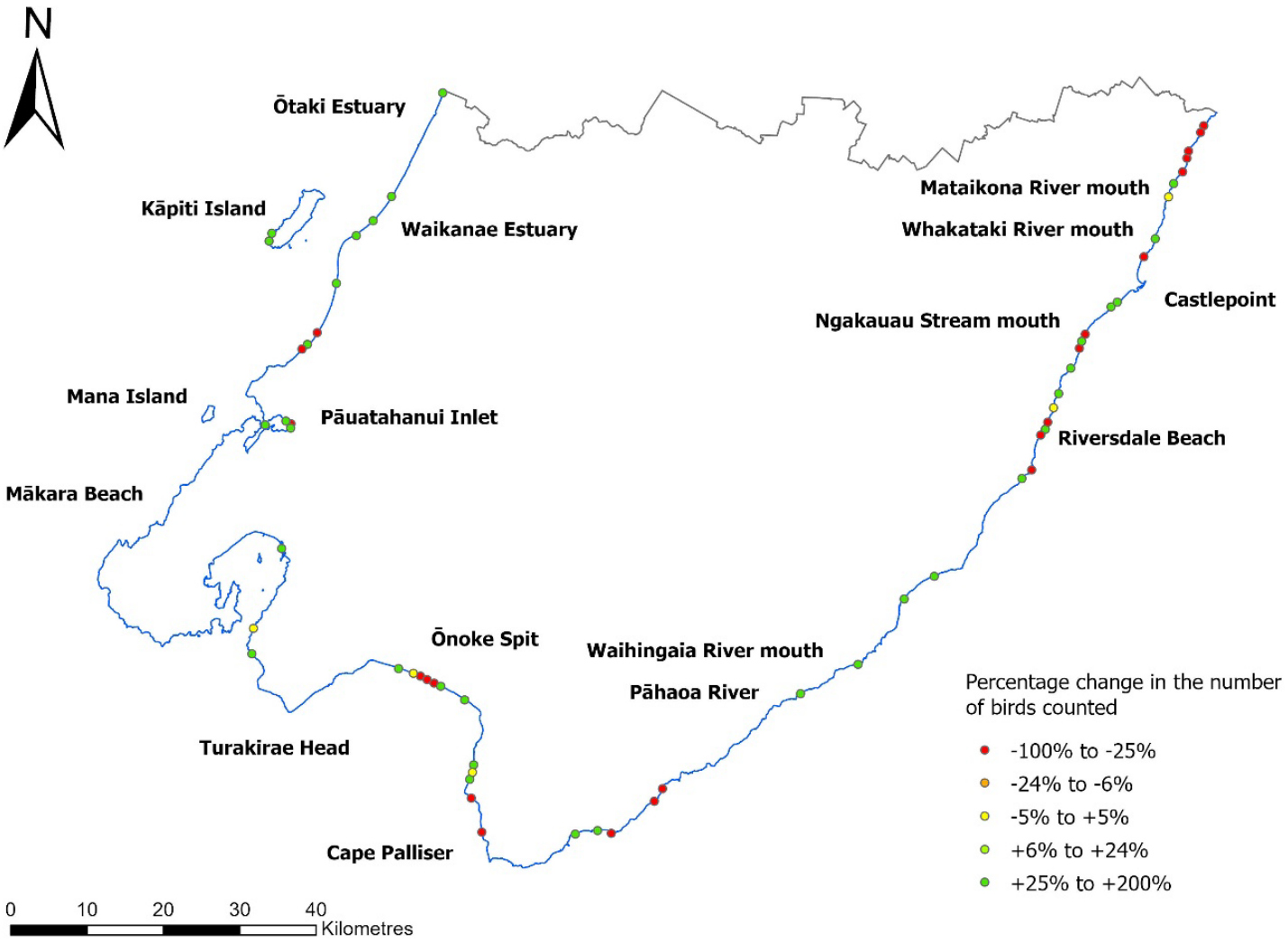


Figure 3.12: Percent change in the local abundance of taranui / Caspian terns per 1 km survey section along the Wellington region coastline between 2017-2018 and 2022-2023.

3.2.5 Kawaupaka / little shag (*Microcarbo melanoleucos*)

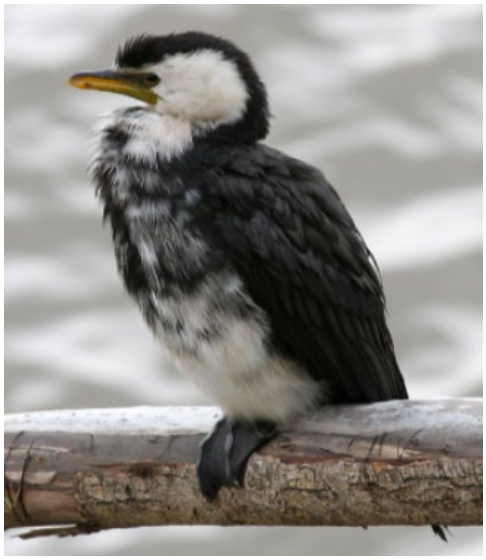


Image courtesy of Ormond Torr/NZ Birds Online

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

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

A total of 159 adult kawaupaka / little shags were counted during the 2022-2023 coastal bird survey, occupying 94 (21%) of the 450 1 km sections of coastline and associated estuaries and coastal lagoons surveyed. This represents a 27% increase from the 125 adult kawaupaka / little shags counted during the 2017-2018 survey, during which this species was found to be occupying 85 (19%) of the 450 sections of coastline surveyed (Figure 3.13). Among the sections of coastline that were surveyed during both the 2017-2018 and 2022-2023 surveys, the mean number of kawaupaka / little shags counted per survey section increased from 0.28 birds per section to 0.35 birds per section. This 25% increase in the mean number of Kawaupaka / little shags counted per section was not statistically significant however ($F_{1,898}$ = 1.85; P = 0.17; one-way ANOVA), likely due to the high level of variation between individual section counts and the low proportion of survey sections occupied by kawaupaka / little shags.

During both surveys, kawau paka / little shags were relatively uncommon along the Wairarapa and Kāpiti coastlines but were much more common in Te Whanganui-a-Tara / Wellington Harbour and Te Awarua o Porirua / Porirua Harbour, and on Kāpiti Island (3.19). Local declines in the abundance of kawaupaka / little shags within individual 1 km survey sections appeared to be randomly distributed along the Wellington region coastline, and these local declines were largely offset by local increases in abundance in nearby survey sections (Figure 3.20).

In Te Whanganui-a-Tara / Wellington Harbour, kawaupaka / little shags are particularly common and widespread, with noticeably higher densities present along the Wellington CBD, Evans Bay and northern Miramar Peninsula foreshores. An average of 0.49 kawaupaka / little shags were recorded per 1 km survey section along the Pōneke / Wellington City coastline between 2018 and 2023, which is 29% higher than the average density of 0.35 birds recorded along 450 km of the Wellington region coastline during 2022-2023 (McArthur 2024). 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).

In the wider Wellington region, kawaupaka / little shags are known to occupy a range of habitats including the coastline, rivers, freshwater wetlands, lakes and ponds (Heather & Robertson, 2015; eBird 2025). Kawaupaka / little shags not only occur along the Wellington region coastline but also

occupy inland freshwater habitats such as rivers and lakes. For example, between 2021 and 2023, GWRC also carried out counts of kawaupaka / little shags along 211 km of riverbed habitats in the Wellington region, counting a total of 57 kawaupaka / little shags (McArthur & Thomas 2022; GWRC unpublished data). Given the widespread distribution of this species, no accurate estimate exists for the size of the Wellington region's kawaupaka / little shag population. Recent counts that have been carried out at all known Kawaupaka / little shag breeding colonies suggests that there is likely to be no greater than 250 breeding pairs in the Wellington region, and somewhere between 250-1000 adult birds in total (Birds New Zealand, unpublished data; GWRC/DOC, unpublished data).

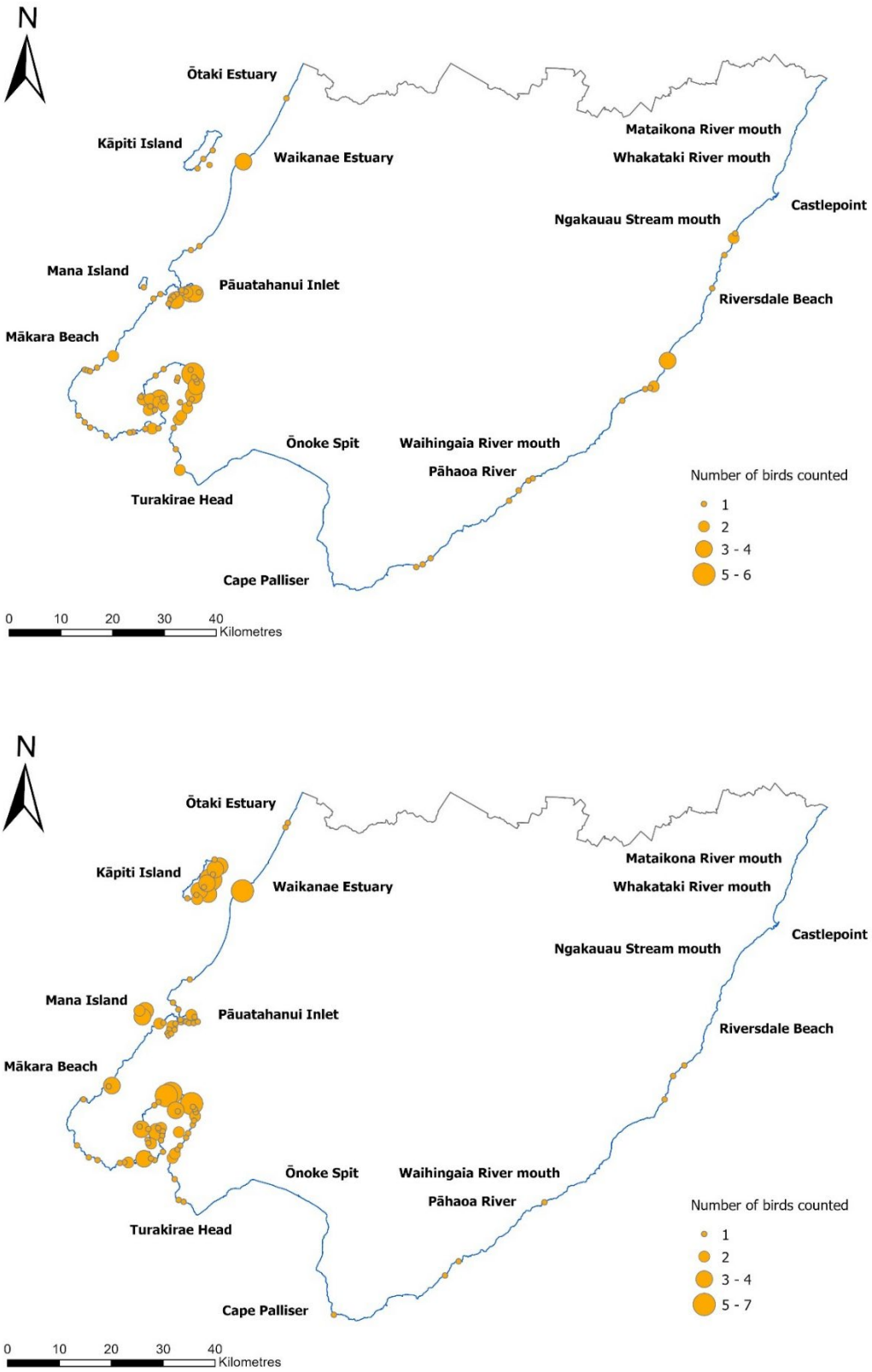


Figure 3.13: Spatial patterns in the local abundance of kawaupaka / little shags per 1 km survey section along the Wellington region coastline in 2017-2018 (top map) and in 2022-2023 (bottom map).

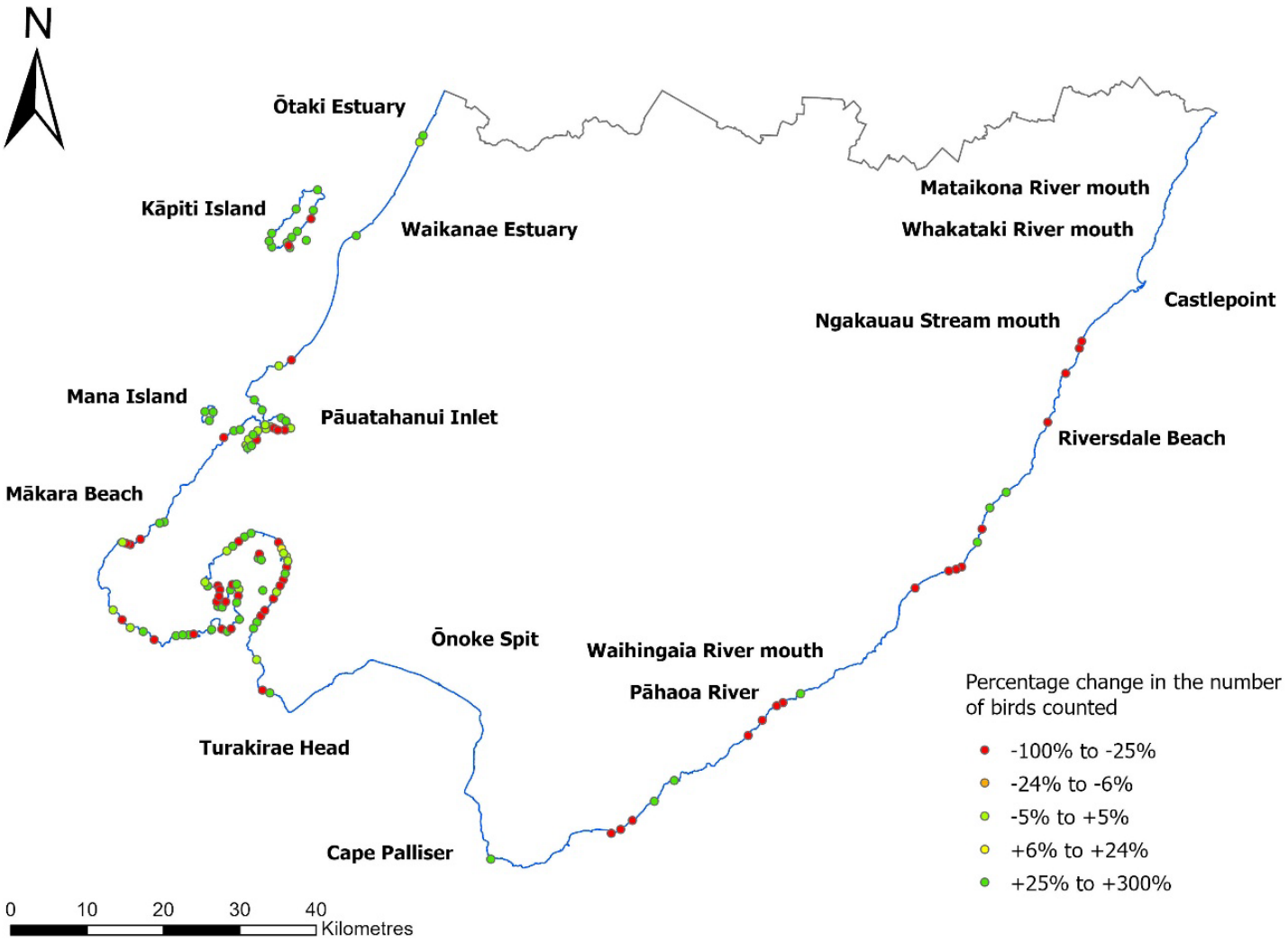


Figure 3.14: Percent change in the local abundance of kawaupaka / little shags per 1 km survey section along the Wellington region coastline between 2017-2018 and 2022-2023.

3.2.6 Tūturiwhatu / New Zealand dotterel (*Anarhynchus obscurus*)

Image courtesy of Bruce Buckman/NZ Birds Online

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

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

Thirty-three adult tūturiwhatu / New Zealand dotterels were counted during the 2022-2023 survey, occupying 17 (3.8%) of the 450 1 km sections of coastline and associated estuaries and coastal lagoons surveyed. This represents a 94% increase from the 17 adult tūturiwhatu / New Zealand dotterels counted during the 2017-2018 survey, during which this species was found to be occupying 7 (1.5%) of the 450 sections of coastline surveyed (Figure 3.15; McArthur *et al.* 2019). Among the sections of coastline that were surveyed during both the 2017-2018 and 2022-2023 surveys, the mean number of tūturiwhatu / New Zealand dotterels counted per survey section increased from 0.04 birds per section in 2017-2018 to 0.07 birds per section in 2022-2023. This 75% increase in the mean number of tūturiwhatu / New Zealand dotterels counted per section was not statistically significant however ($F_{1,898}$ = 1.59; P = 0.21; one-way ANOVA), likely due to the low proportion of survey sections occupied by tūturiwhatu / New Zealand dotterels and the high variation in the number of adult birds encountered in each occupied survey section.

During both the 2017-2018 and 2022-2023 surveys, tūturiwhatu / New Zealand dotterels were not uniformly distributed along the coastline, but instead were highly clustered at estuaries, river mouths and along stretches of wide, sandy beaches. (Figures 3.15 and 3.16). On the west coast of the Wellington region, tūturiwhatu / New Zealand dotterels were encountered at two new sites during the 2022-2023 survey, at the Waitohu and Waikawa estuaries. Along the Wairarapa coastline, the Pāhaoa Estuary continues to be the global southern limit of the breeding range for the northern subspecies of tūturiwhatu / New Zealand dotterels. Further to the north, a local decline in the number of adults breeding at the Motuwaireka Stream mouth (Riversdale Beach) since 2017-2018 has been more than offset by local increases in bird numbers elswhere along the Wairarapa coastline, most notably at Flat Point (Figures 3.15 and 3.16). This species was observed breeding at five locations along the Wellington region coastline during the 2022-2023 survey, namely at Waitohu Estuary and at the Okau, Ngakauau, Otahome and Motuwaireka Stream mouths. Breeding was also observed at the Waikanae Estuary, and at the Mataikona, Whakataki and Pahaoa river mouths during the 2017-2018 survey (McArthur *et al.* 2019), meaning that tūturiwhatu / New Zealand dotterels have now been observed breeding at a total of nine coastal sites in the Wellington region since 2017-2018.

This population increase observed between 2017-2018 and 2022-2023 is almost certain to be due to the implementation of a highly successful species recovery plan that has been in operation since the mid-1980s, with conservation mangement activities now being implemented at dozens of sites throughout Northland, Auckland and the Bay of Plenty. Since 1989, the total number of tūturiwhatu / New Zealand dotterels has increased by 50%, from an estimated population of 1,320 birds in 1989 to 2,130 birds in 2011 (Dowding, 2020). This population increase has coincided with a steady southward

expansion in the breeding range of tūturiwhatu / New Zealand dotterels in the North Island. Tūturiwhatu / New Zealand dotterels began re-colonising Hawke's Bay in 1990, with the Hawke's Bay population increasing from an estimated population of four adult birds in 1990 to a peak of 222 adult birds in 2021 before declining to 142 birds in 2023 due to the impacts of Cyclone Gabrielle (Foreman, 1991; McArthur *et al.* 2024). Tūturiwhatu / New Zealand dotterels began colonising the Wellington region from 2009 when birds began breeding at the Motuwaireka River mouth at Riversdale Beach (McArthur *et al.* 2019). Local conservation management initiatives being carried out at coastal sites in both the Hawke's Bay and Wellington regions in recent years have also likely contributed to the recolonisation of this species along the lower North Island coastline since 1990.

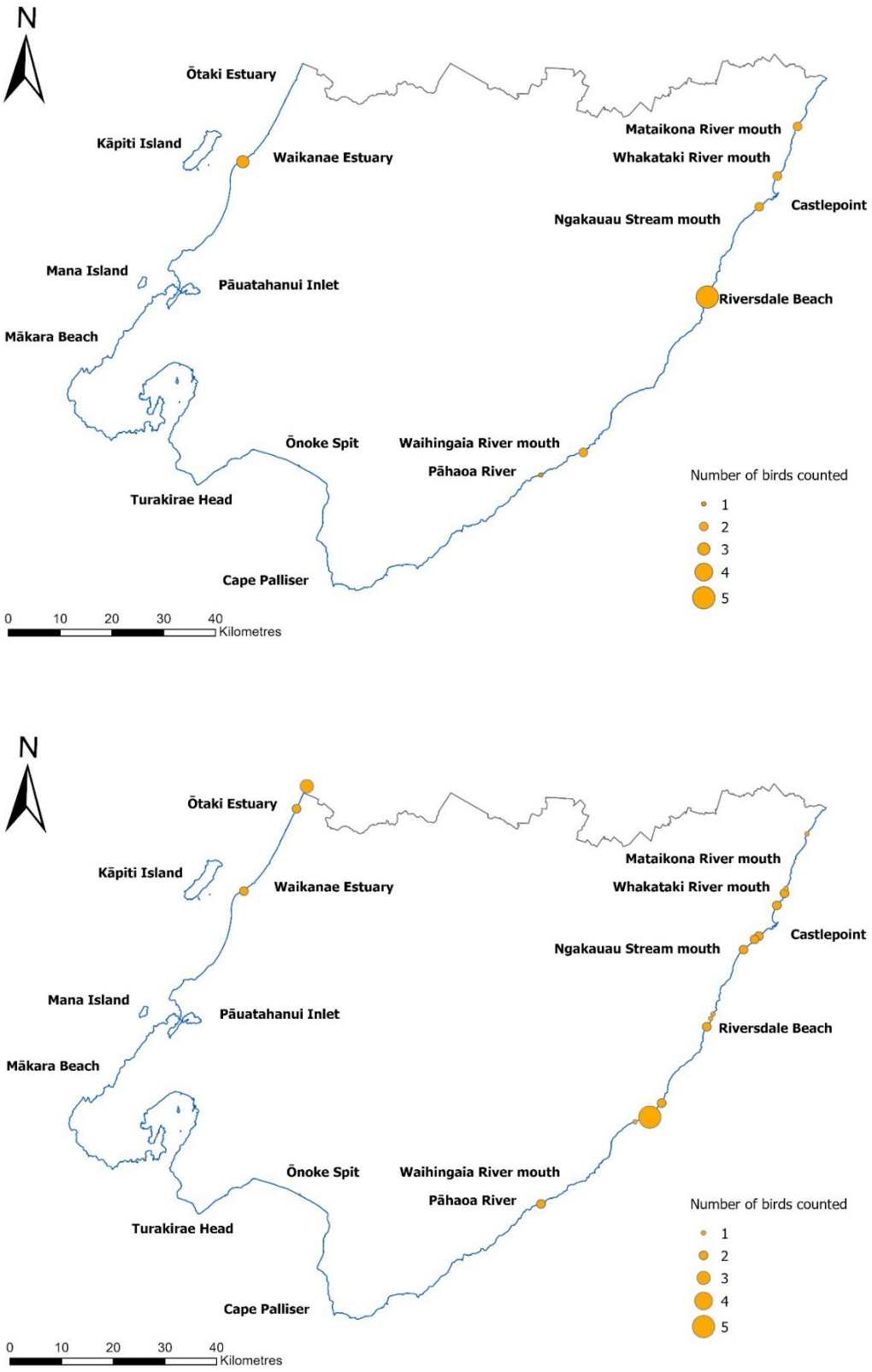


Figure 3.15: Spatial patterns in the local abundance of tūturiwhatu / New Zealand dotterels per 1 km survey section along the Wellington region coastline in 2017-2018 (top map) and in 2022-2023 (bottom map).

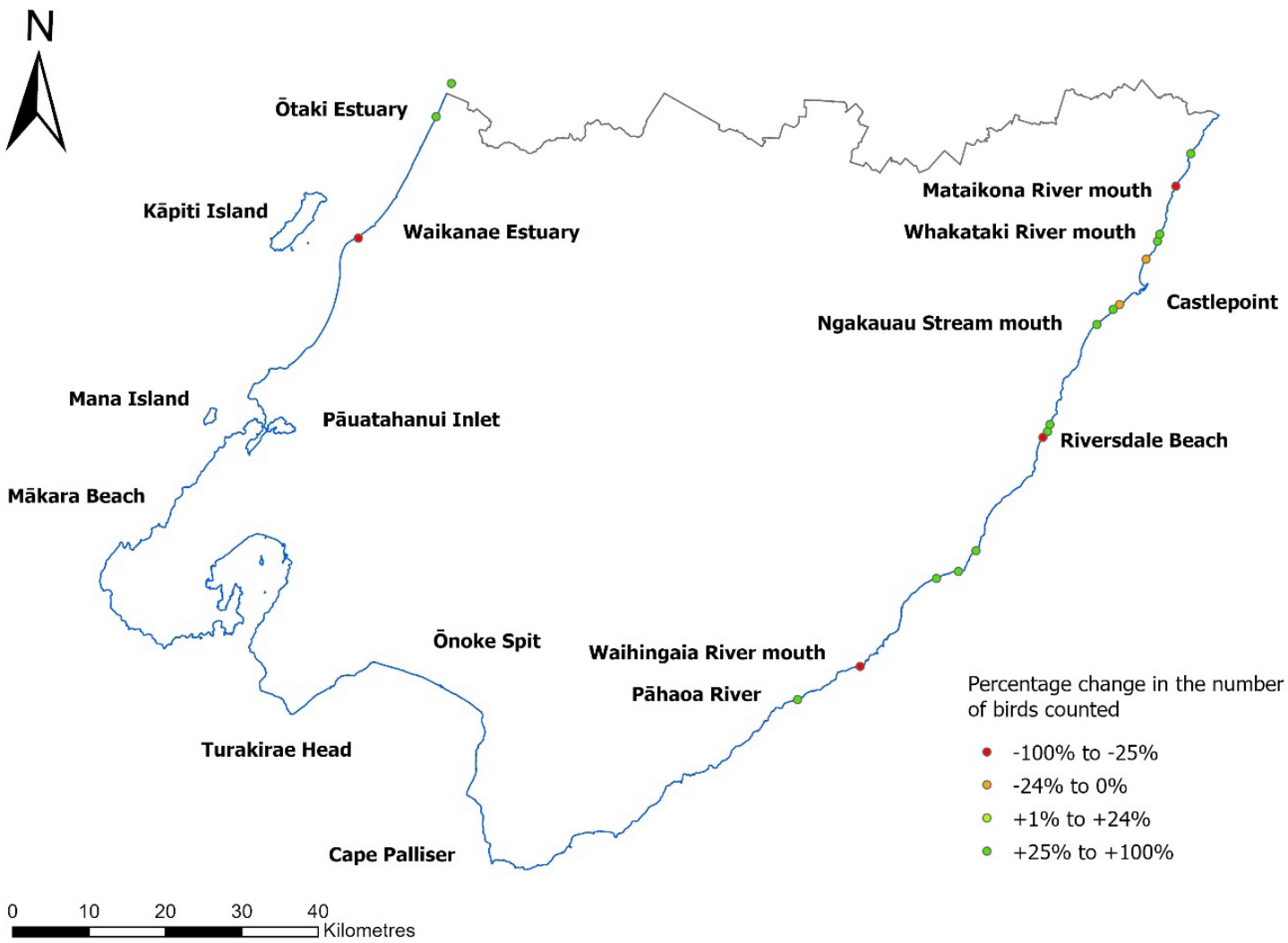


Figure 3.16: Percent change in the local abundance of tūturiwhatu / New Zealand dotterels per 1 km survey section along the Wellington region coastline between 2017-2018 and 2022-2023.

3.2.7 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 total of 110 pīhoihoi / New Zealand pipits were counted during the 2022-2023 coastal bird survey, occupying 70 (16%) of the 450 1 km sections of coastline and associated estuaries and coastal lagoons surveyed. This is a 38% increase from the 80 pīhoihoi / New Zealand pipits counted during the 2017-2018 survey, during which this species was found to be occupying 52 (12%) of the 450 sections of coastline surveyed (Figure 3.17). Among the sections of coastline that were surveyed during both the 2017-2018 and 2022-2023 surveys, the mean number of pīhoihoi / New Zealand pipits counted per survey section increased from 0.17 birds per section in 2017-2018 to 0.24 birds per section in 2022-2023. This 41% increase in the mean number of pīhoihoi / New Zealand pipits counted per section was not statistically significant however ($F_{1,898}$ = 3.18; P = 0.08; one-way ANOVA), likely due to the low proportion of survey sections occupied by pīhoihoi / New Zealand pipits and the high variation in the number of adult birds encountered in each occupied survey section.

During both surveys, pihoihoi / New Zealand pipits were fairly scarce and scattered along much of the Wellington region coastline. Hotspots of local abundance occurred along four discrete stretches of coastline however, with local concentrations of birds present along the south-west Wellington coastline, between Titahi Bay and Pukerua Bay; in Fitzroy Bay between Pencarrow Head and Turakirae Head; on Ōnoke Spit and Whangaimoana Beach, and along the Te Awaiti coastline between the Awhea and Pāhaoa River mouths. Pīhoihoi / New Zealand pipits remain largely absent from the Kāpiti coast north of Pukerua Bay, and from Wellington Harbour (Figure 3.17). Local declines in the abundance of pihoihoi / New Zealand pipits within individual 1 km survey sections appeared to be randomly distributed along the Wellington region coastline, and these local declines were largely offset by local increases in abundance in nearby survey sections (Figure 3.18).

The relatively small numbers of pīhoihoi / New Zealand pipits encountered during these surveys are consistent with the low numbers of birds encountered during other recent coastal bird surveys carried out in central New Zealand. For example, only 40 pīhoihoi / New Zealand pipits were recorded along 333 km of the Hawke's Bay region coastline in 2024 (McArthur *et al.* 2024), and 31 pīhoihoi / New Zealand pipits were recorded along 160 km of the Manawatū-Whanganui coastline in 2025 (Horizons Regional Council, unpublished data). No pīhoihoi / New Zealand pipits were recorded at all along 428 km of the Nelson-Tasman coastline in 2020 (McArthur *et al.* 2021; McArthur *et al.* 2022). These results are surprising, considering the large areas of apparently suitable habitat that were searched during these surveys, and they may indicate that pīhoihoi / New Zealand pipits are much less common in central parts of New Zealand than previously assumed.

In the Wellington region, pihoihoi / New Zealand pipits not only occur along the Wellington region coastline, but also occupy a range of habitats including riverbeds, rough pasture, felled exotic forest compartments and subalpine tussock and herbfields (eBird, 2025). Pīhoihoi / New Zealand pipits are

seldom common in any of these habitats, however. In December 2022, 78 pīhoihoi / New Zealand pipits were counted along 211 km of rivers in the Wellington region (GWRC, unpublished data), indicating that river and coastal habitats in the Wellington region support an estimated population of at least 188 adult pīhoihoi / New Zealand pipits. No accurate estimates currently exist for the number of pipits occupying terrestrial habitats in the Wellington region, however combining these river and coastal count data with an extrapolation of pipit distribution data from the *Atlas of Bird Distribution in New Zealand* (Robertson *et al*. 2007) indicates that there are between 1,000 and 5,000 adult pihoihoi / New Zealand pipits in the Wellington region (GWRC/DOC unpublished data).

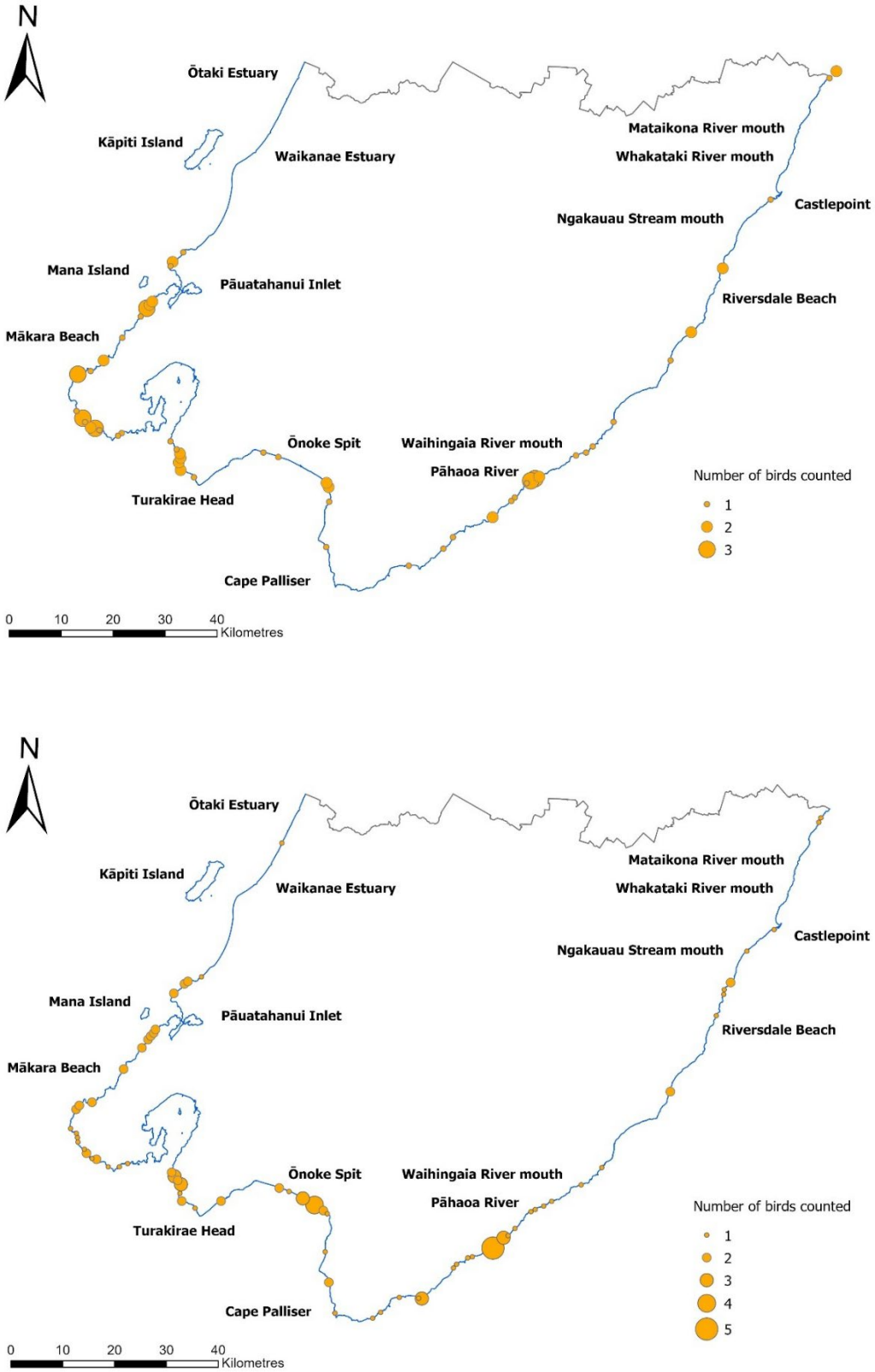


Figure 3.17: Spatial patterns in the local abundance of pīhoihoi / New Zealand pipits per 1 km survey section along the Wellington region coastline in 2017-2018 (top map) and in 2022-2023 (bottom map).

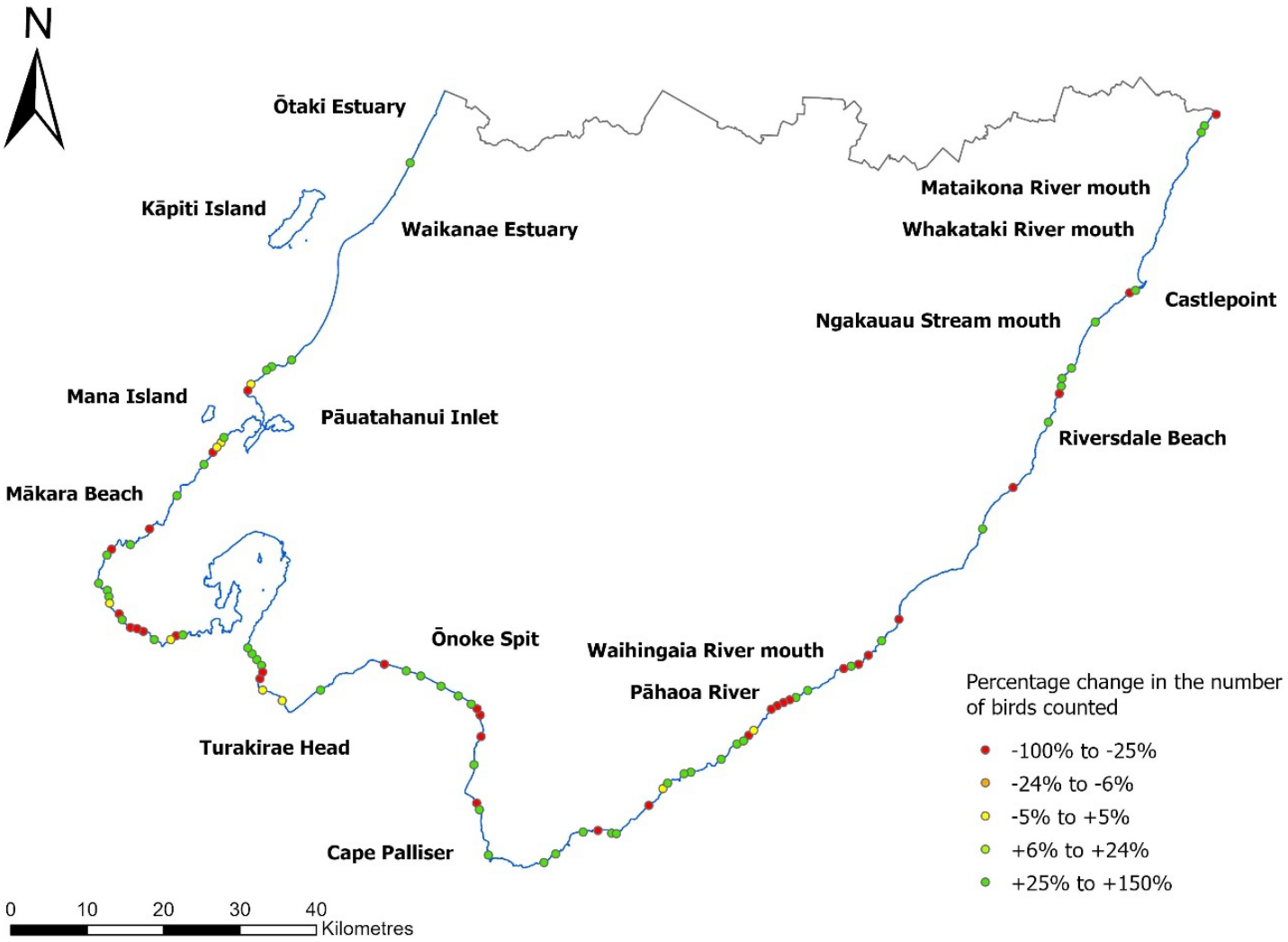


Figure 3.18: Percent change in the local abundance of pīhoihoi / New Zealand pipits per 1 km survey section along the Wellington region coastline between 2017-2018 and 2022-2023.

3.2.8 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 total of 439 adult kāruhiruhi / pied shags were counted during the 2022-2023 coastal bird survey, representing a 7% decline from the 474 adult birds counted during the 2017-2018 survey. Despite this decline, the number of 1 km survey sections occupied by kāruhiruhi / pied shags increased by 22% over the same period. Kāruhiruhi / pied shags were encountered in 125 (28%) of survey sections during 2017-2018 survey, and in 153 (34%) of survey sections during the 2022-2023 survey. (Figure 3.19; McArthur *et al.* 2019). Among the sections of coastline that were surveyed during both the 2017-2018 and 2022-2023 surveys, the mean number of kāruhiruhi / pied shags counted per survey section declined from 1.05 birds per section in 2017-2018 to 0.98 birds per section in 2022-2023. This 7% decline in the mean number of kāruhiruhi / pied shags counted per section was not statistically significant however ($F_{1,898}$ = 0.087; P = 0.76; one-way ANOVA).

During both surveys, kāruhiruhi / pied shags were relatively common and widespread along the Kāpiti and south-west Wellington coastlines to as far east as Ōnoke Spit. During the 2017-2018 survey, kāruhiruhi were largely absent from the Wairarapa coastline to the east of Ōnoke Spit, but during the 2022-2023 survey, kāruhiruhi / pied shags were encountered in reasonable numbers along the Cape Palliser coastline and were more widespread along the eastern Wairarapa coastline (Figures 3.19 and 3.20). This result indicates that the kāruhiruhi / pied shag distribution is continuing to expand eastwards in the Wellington region. A total of five coastal breeding colonies of kāruhiruhi / pied shags were observed during this survey, at Waikawa Estuary, Waimanu Lagoon (Waikanae Estuary), Moorehouse Point (Pāuatahanui Inlet), Mākara Estuary and at Cape Palliser. The Cape Palliser colony was not present during the 2017-2018 survey, indicating that the breeding range of this species is also continuing to expand eastwards along the Wairarapa coastline. Kāruhiruhi / pied shags colonies were recorded at three additional locations during the 2017-2018 survey, at Pukerua Bay, on Mana Island, and at Lake Kohangatera (McArthur *et al.* 2019). This brings the total number of known kāruhiruhi / pied shag coastal breeding colonies in the Wellington region to eight. A total of 66 occupied nests were counted across six breeding colonies during the 2017-2018 survey, and 50 occupied nests were counted across five colonies during the 2022-2023 survey (McArthur *et al.* 2019).

Kāruhiruhi / pied shags have a disjunct distribution in New Zealand, with a southern breeding population in the southern South Island/Stewart Island, a central breeding population in the northern South Island and Wellington, and a northern breeding population in Northland, Auckland, Bay of Plenty and East Cape (Robertson *et al*. 2007; Bell, 2013). The 'central' breeding population has expanded considerably since the 1950s, with birds colonising the Wellington region in 1996 with the establishment of the breeding colony at the Mākara Estuary (Powlesland *et al*. 2008; Bell, 2013). Since 2008, at least another 11 breeding colonies have become established in the Wellington region. In

addition to the eight coastal colonies found during these surveys (including the Mākara Estuary colony), additional colonies are also present on the lower reservoir in Zealandia Te Māra a Tāne; at Pharyzyn Reserve (Waikanae); at Lake Nganoke (Palliser Bay), and near the Ōtaki Estuary (eBird, 2025). The coastal distribution of kāruhiruhi / pied shags and māpunga / black shags (Figure 3.7) in the Wellington region appear to be almost mutually exclusive at the present time, suggesting that some form of competitive exclusion may be occurring between these two species, with kāruhiruhi / pied shags being the more dominant of the two species. It's possible therefore that as the distribution of kāruhiruhi / pied shags continues to expand eastwards into the Wairarapa, māpunga / black shags may become increasingly scarce along the eastern Wairarapa coastline.

To estimate the size of the Wellington region's kāruhiruhi / pied shag population, we can combine our count of 50 occupied nests at the five colonies located during the 2022-2023 coastal bird survey with recent maximum counts of the number of occupied nests at the seven other colonies not visited during this survey, by sourcing these additional count data from the New Zealand eBird database (eBird, 2025). In recent years, counts of the maximum number of occupied nests present at the Zealandia Te Māra a Tāne, Pharyzyn Reserve, Lake Nganoke, Ōtaki Estuary, Mana Island, Pukerua Bay and Lake Kohangatera colonies during summer have totalled 47 occupied nests (eBird, 2025). Combining these two estimates together, the Wellington region supports a minimum breeding population of 97 breeding pairs, or 194 adult kāruhiruhi / pied shags. It should be noted, however, that kāruhiruhi / pied shags breed year-round with between 32% and 53% of adult birds nesting in any given month of the year (Millener, 1972; Powlesland *et al*. 2008; Bell, 2013). During November and December, the proportion of adult birds present at established breeding colonies is typically around 50%, suggesting that our estimate of 194 breeding adults in the Wellington region is almost certainly an underestimate, and that the true number of breeding adults in the region could be as high as 388 birds (Bell, 2013). The 439 kāruhiruhi / pied shags counted during the 2022-2023 survey, including birds encountered both at breeding colonies and away from breeding colonies, further suggests that the true breeding population size is significantly higher than our minimum population estimate of 194 birds.

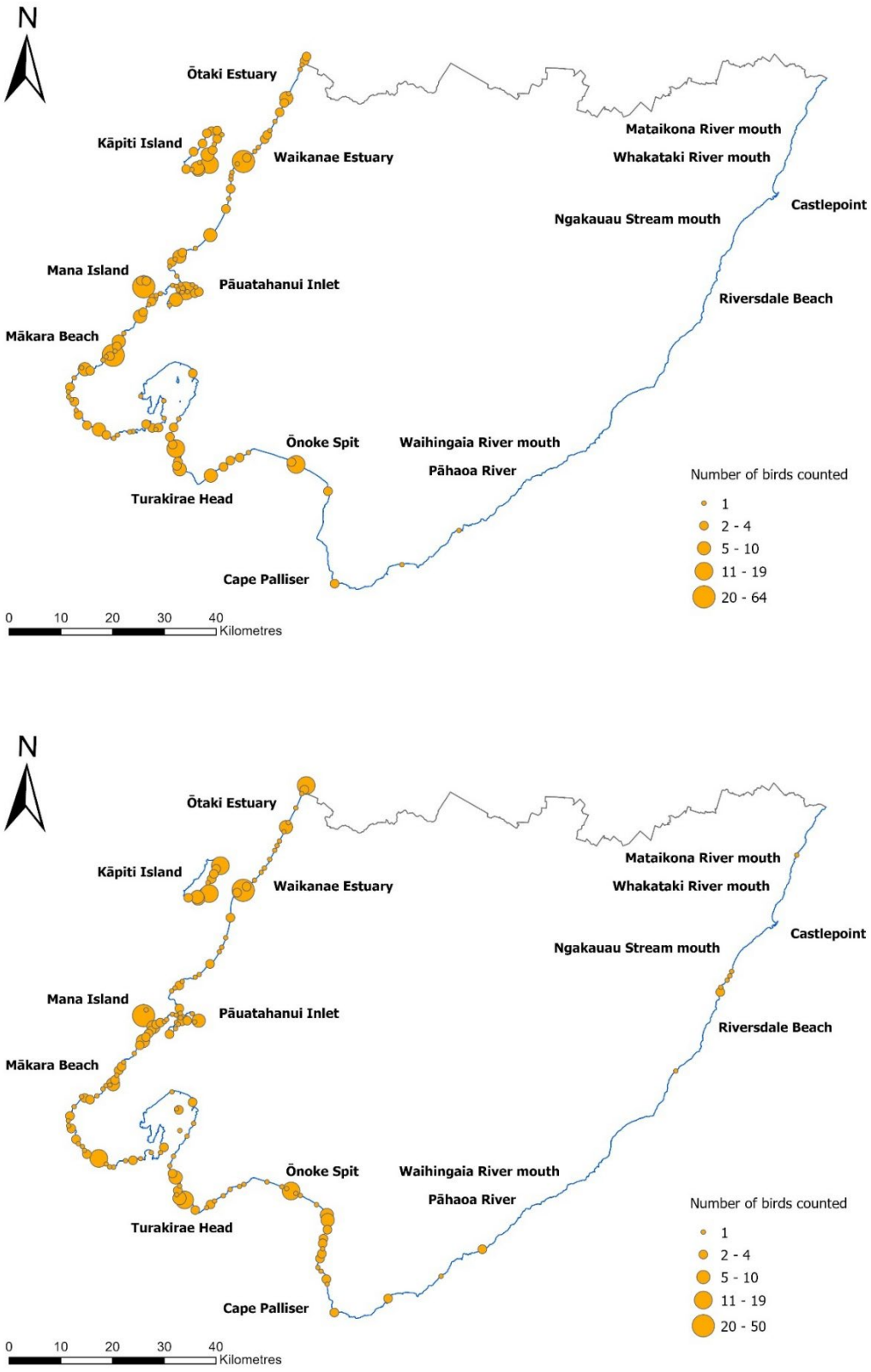


Figure 3.19: Spatial patterns in the local abundance of kāruhiruhi / pied shags per 1 km survey section along the Wellington region coastline in 2017-2018 (top map) and in 2022-2023 (bottom map).

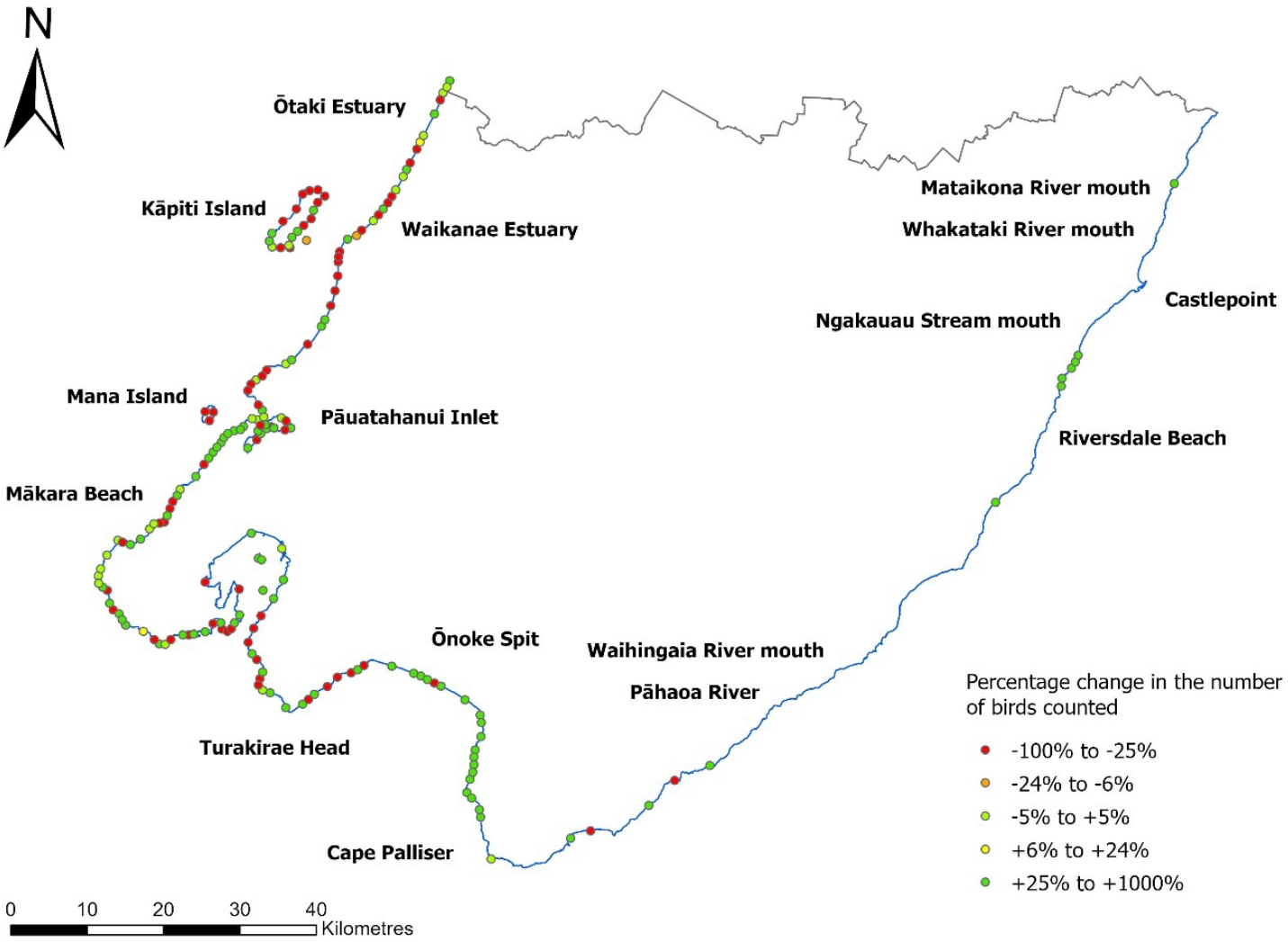


Figure 3.20: Percent change in the local abundance of kāruhiruhi / pied shags per 1 km survey section along the Wellington region coastline between 2017-2018 and 2022-2023.

3.2.9 Poaka / pied stilt (*Himantopus himantopus*)

Image courtesy of Tony Whitehead/NZ Birds Online

National conservation status:
Not Threatened (Robertson *et al.* 2021)

Regional conservation status:
Not Threatened (Crisp *et al.* 2024)

Two hundred and seventy-nine adult poaka / pied stilts were counted during the 2022-2023 survey, occupying 54 (11.9%) of the 450 1 km sections of coastline and associated estuaries and coastal lagoons surveyed. This represents a 63% increase from the 171 adult poaka / pied stilts counted during the 2017-2018 survey, during which this species was found to be occupying 33 (7.3%) of the 450 sections of coastline surveyed (Figure 3.21; McArthur *et al.* 2019). Among the sections of coastline that were surveyed during both the 2017-2018 and 2022-2023 surveys, the mean number of poaka / pied stilts counted per survey section increased from 0.38 birds per section in 2017-2018 to 0.62 birds per section in 2022-2023. This 63% increase in the mean number of poaka / pied stilts counted per section was not statistically significant however ($F_{1,898}$ = 1.96; P = 0.16; one-way ANOVA), likely due to the low proportion of survey sections occupied by poaka / pied stilts and the high variation in the number of adult birds encountered in each occupied survey section.

During both the 2017-2018 and 2022-2023 surveys, poaka / pied stilts were sparsely distributed along the Wellington region coastline, and tended to be highly clustered at estuaries, river mouths and coastal lagoons. There was a noticeable increase in the number of birds recorded along the eastern Wairarapa coastline, and in Pāuatahanui Inlet between 2017-2018 and 2022-2023 (Figures 3.21 and 3.22). Unlike black-fronted dotterels, these local increases did not coincide with concurrent declines in the number of poaka / pied stilts occupying the region's riverbed habitats. Instead, the number of poaka / pied stilts counted along 211 km of riverbed habitat in the Wellington region increased from 317 birds counted in 2017 to 421 birds counted in 2022 (McArthur & Burgin, 2017; GWRC unpublished data). These results indicate that there has been a net increase in total number of poaka / pied stilts breeding in riverine and coastal habitats in the Wellington region since 2017, despite recent the recent flooding that has occurred in a number of Wairarapa river catchments (McArthur & Thomas, 2024).

In the Wellington region, poaka / pied stilts are known to breed in a range of habitats including on riverbeds and at coastal estuaries and river mouths, but also in freshwater wetlands, on the shores of freshwater lakes and irrigation dams, and in flat, poorly drained paddocks (Heather & Robertson, 2015; eBird, 2024). This being the case, we cannot say whether the increase in the number of poaka / pied stilts breeding in riverine and coastal habitats in the Wellington region represents an increase in the size of the regional breeding population, or whether these local population increases been caused by breeding birds being displaced from other freshwater habitats in the region. Given the substantial improvements in wetland habitat quality that have been achieved at key sites such as the Wairarapa Moana wetlands over the past 10-15 years, the latter of these two scenarios appears to be relatively unlikely.

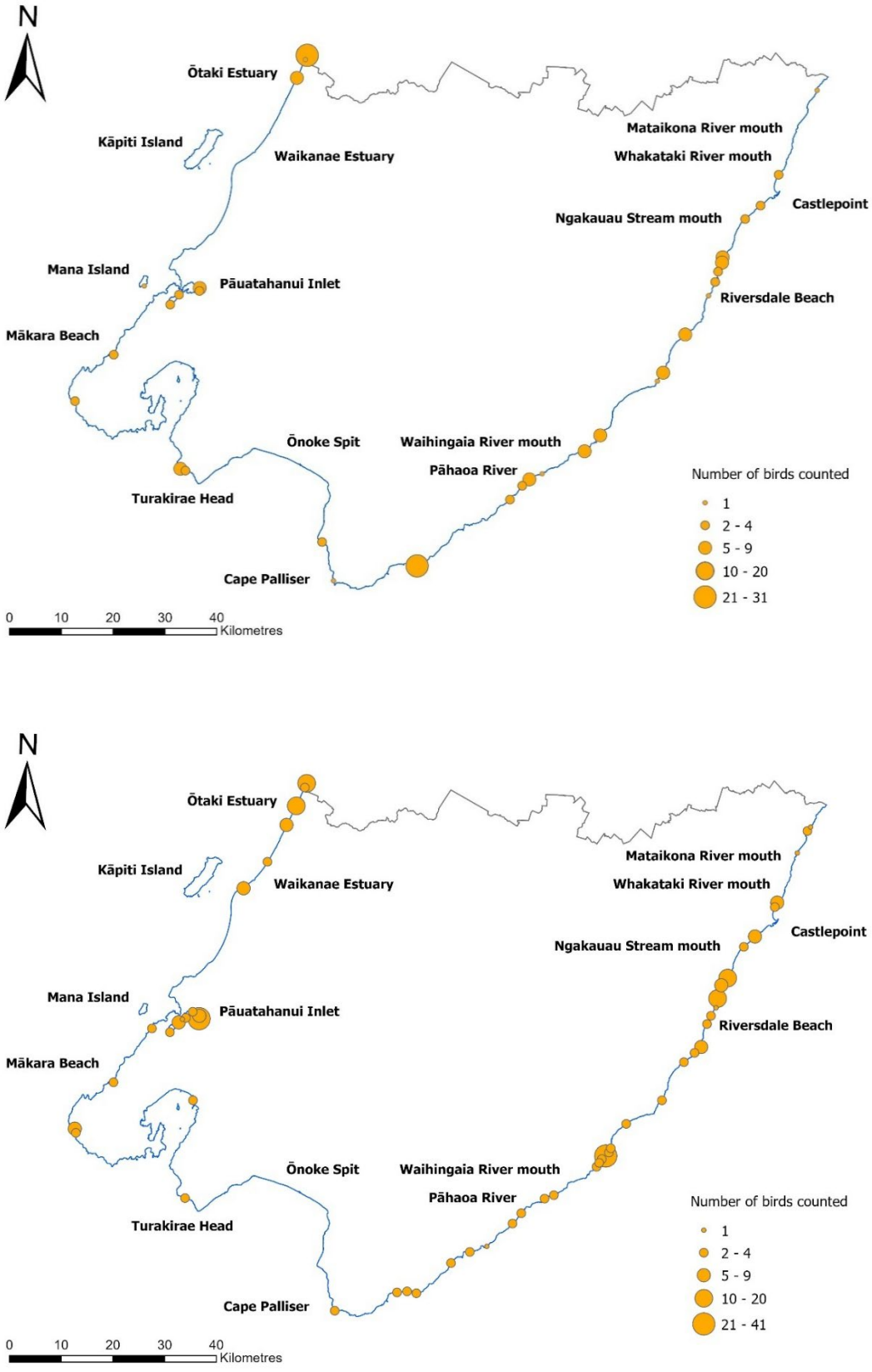


Figure 3.21: Spatial patterns in the local abundance of poaka / pied stilts per 1 km survey section along the Wellington region coastline in 2017-2018 (top map) and in 2022-2023 (bottom map).

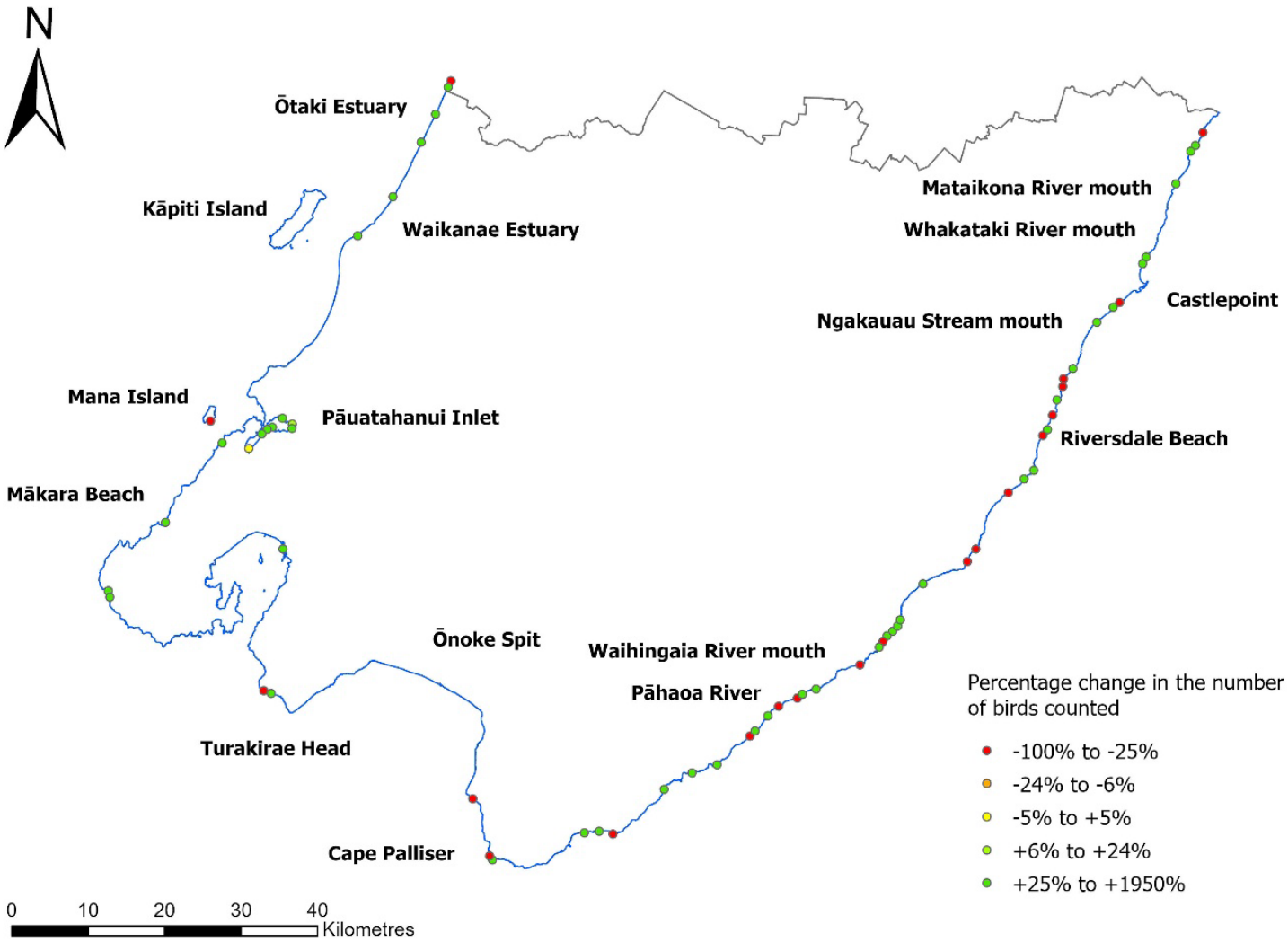


Figure 3.22: Percent change in the local abundance of poaka / pied stilts per 1 km survey section along the Wellington region coastline between 2017-2018 and 2022-2023.

3.2.10 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)

The tarāpunga / red-billed gull was one of the most abundant and widespread coastal bird species encountered during the 2022-2023 bird survey. A total of 3,585 adult tarāpunga / red-billed gulls were counted during the 2022-2023 survey, occupying 288 (64%) of the 450 1 km sections of coastline and associated estuaries and coastal lagoons surveyed. This is a 32% decline from the 5,255 adult tarāpunga / red-billed gulls counted during the 2017-2018 survey, during which this species was found to be occupying 273 (60%) of the 450 sections of coastline surveyed (Figure 3.23). Among the sections of coastline that were surveyed during both the 2017-2018 and 2022-2023 surveys, the mean number of tarāpunga / red-billed gulls counted per survey section declined from 11.7 birds per section in 2017-2018 to 7.9 birds per section in 2022-2023. This 32% decline in the mean number of tarāpunga / red-billed gulls counted per section was not statistically significant however ($F_{1,898}$ = 1.10; P = 0.30; one-way ANOVA), likely due to the high variation in the number of adult birds encountered in each occupied survey section.

During both surveys, tarāpunga / red-billed gulls were not uniformly distributed along the Wellington region coastline, instead appearing to be clustered along stretches of coastline adjacent, or in proximity to breeding colonies. Tarāpunga / red-billed gulls were particularly common along the Wellington and Porirua City foreshores, presumably attracted to these stretches of coastline by the foraging opportunities provided by nearby urban habitats. During both surveys, tarāpunga / red-billed gulls appeared to be largely absent from the south-west Wellington coastline between Sinclair Head and Mākara Beach and were relatively uncommon in Palliser Bay (Figure 3.23). Local declines and increases in tarāpunga / red-billed gulls along the Wellington region coastline appeared to be non-randomly distributed, possibly due to changes in the locations of breeding colonies or local food resources, or to differences in the state of the tide between these two surveys (Figure 3.24).

During the 2022-2023 coastal bird survey tarāpunga / red-billed gulls were found nesting at three locations along the Wellington region coastline, on Mana Island, at Cape Palliser and at Castlepoint. Each of these nesting colonies were broadly associated with local concentrations of adult tarāpunga / red-billed gulls counted in adjacent survey sections, indicating that the distribution of tarāpunga / red-billed gulls along the Wellington region coastline is strongly influenced by the location of nesting colonies. Tarāpunga / red-billed gulls were observed breeding at six additional sites during the 2017-2018 coastal bird survey, on Kāpiti Island, at Point Dorset (Miramar Peninsula), on the Te Awaiti coastline and at the Pāhaoa River mouth (McArthur *et al.* 2019). In recent years, tarāpunga / red-billed gulls have also been observed breeding on Wairaka Rock (between Plimmerton and Pukerua Bay), on Taputeranga Island and at Whitirea Park, (McArthur, 2024; eBird 2025), bringing the total

number of known tarāpunga / red-billed gulls nesting sites in the Wellington region to twelve. During the 2017-2018 coastal bird survey, a total of 1,239 occupied tarāpunga / red-billed gull nests were counted along the Wellington region coastline, providing a regional breeding population estimate of 2,478 birds (McArthur *et al.* 2019). Unfortunately, the 2022-2023 survey was carried out 1-2 months later in the season and the tarāpunga / red-billed gull nesting colonies had either disbanded or had passed peak incubation. For this reason, it wasn't possible to obtain an accurate regional breeding population estimate from the 2022-2023 survey dataset.

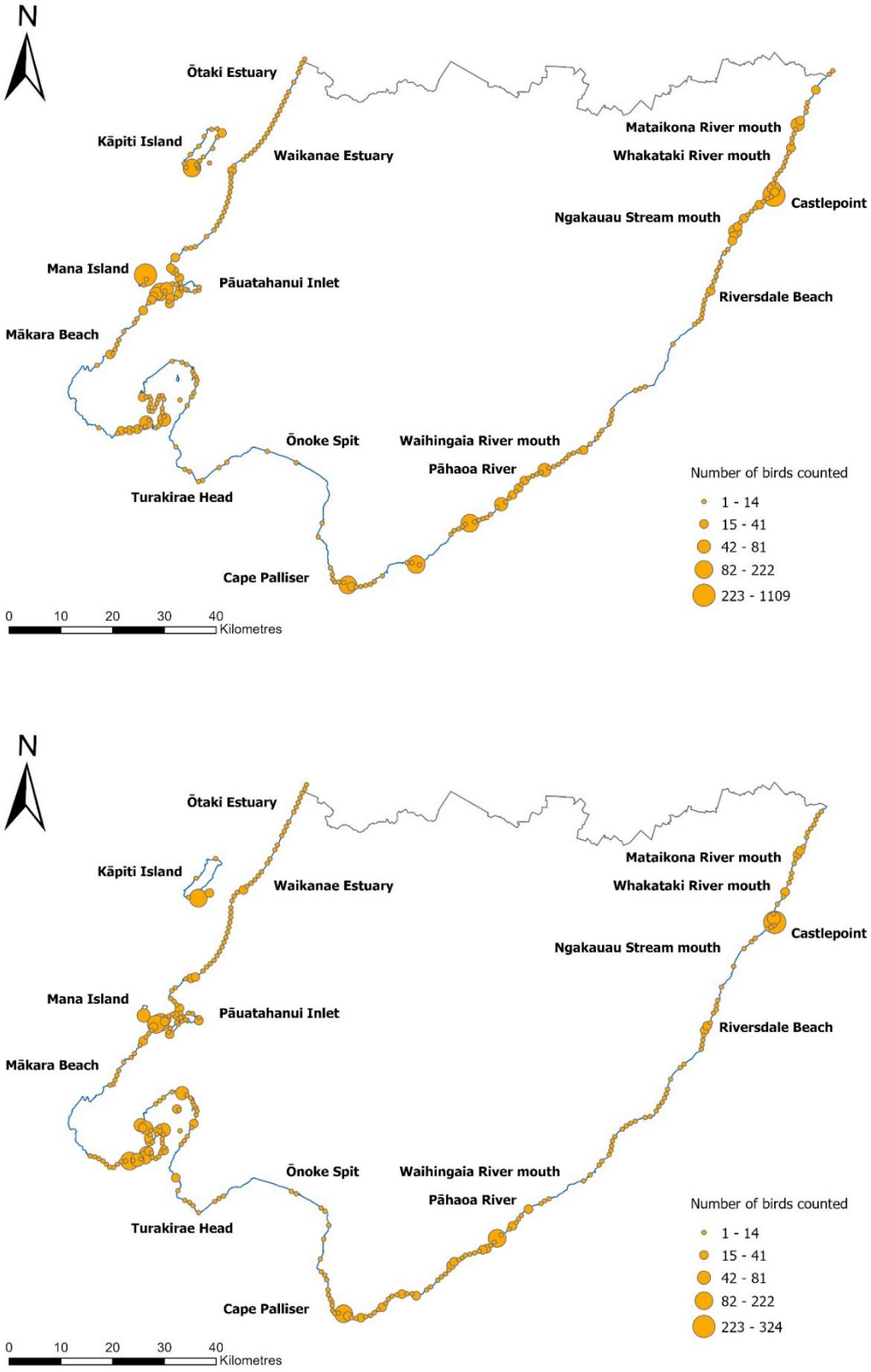


Figure 3.23: Spatial patterns in the local abundance of tarāpunga / red-billed gulls per 1 km survey section along the Wellington region coastline in 2017-2018 (top map) and in 2022-2023 (bottom map).

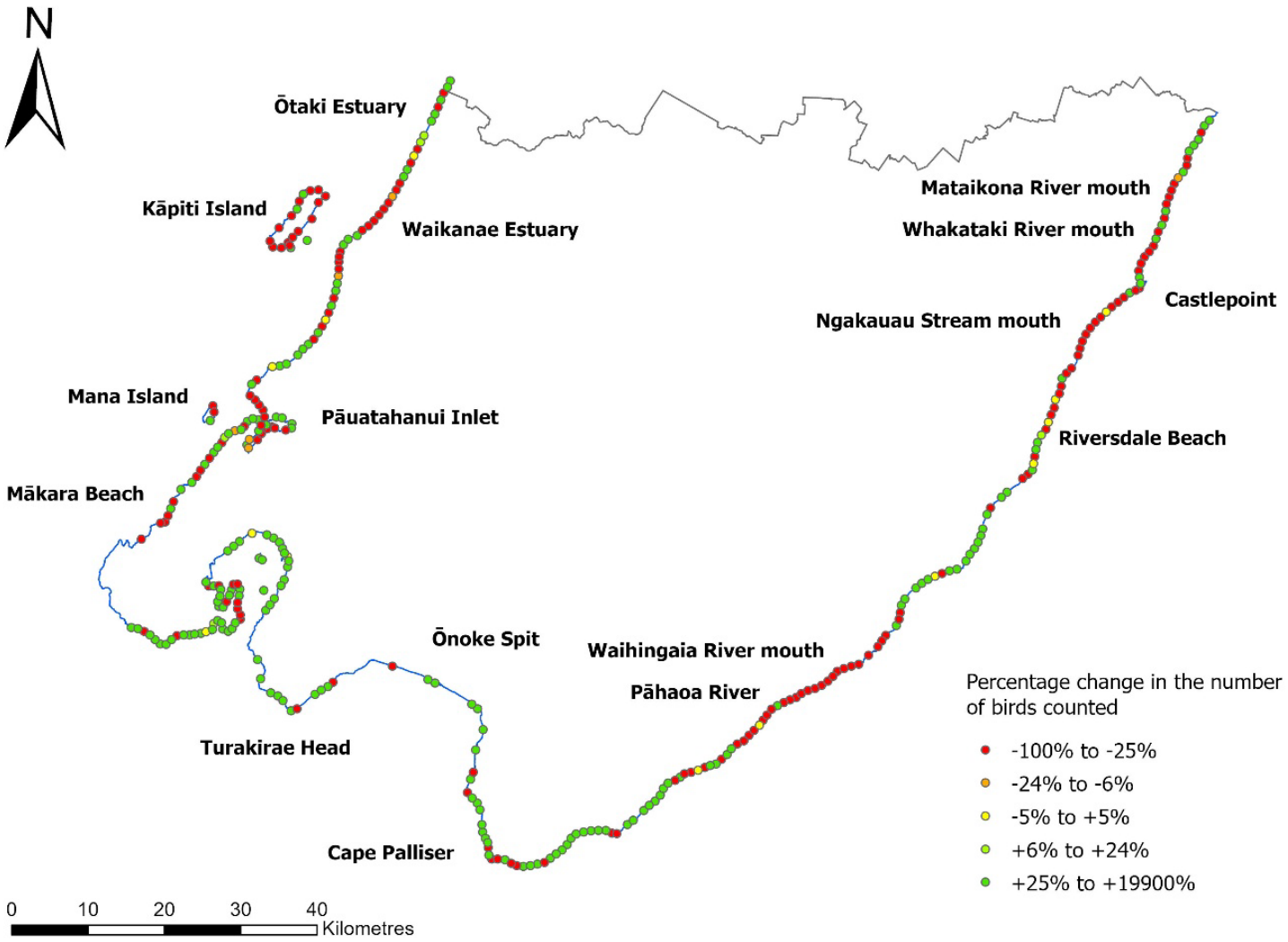


Figure 3.24: Percent change in the local abundance of tarāpunga / red-billed gulls per 1 km survey section along the Wellington region coastline between 2017-2018 and 2022-2023.

3.2.11 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)

The matuku moana / reef heron is currently one the rarest breeding bird species present in the Wellington region (McArthur *et al.* 2019). A total of 17 adult matuku moana / reef herons were counted during the 2022-2023 coastal bird survey, occupying 17 (4%) of the 450 1 km sections of coastline and associated estuaries and coastal lagoons surveyed. This is a 14% increase from the 15 adult matuku moana / reef herons counted during the 2017-2018 survey, during which this species was found to be occupying 14 (3%) of the 450 sections of coastline surveyed (Figure 3.25; McArthur *et al.* 2019). Among the sections of coastline that were surveyed during both the 2017-2018 and 2022-2023 surveys, the mean number of matuku moana / reef herons counted per survey section increased by 33%, from 0.03 birds per section in 2017-2018 to 0.04 birds per section in 2022-2023.

The distribution of matuku moana / reef herons in the Wellington region appears to have changed little since the 2018-2018 survey. During the 2022-2023 survey, six birds were encountered along the eastern Wairarapa coastline, a further five birds were encountered on Kāpiti, Tokomapuna, Tahoramaurea and Matiu-Somes Islands, and six additional birds were encountered along the Kāpiti and Wellington City coastlines between Pukerua Bay and Sinclair Head (Figure 3.25). Local declines in the abundance of matuku moana / reef herons within individual 1 km survey sections appeared to be randomly distributed along the Wellington region coastline, and these local declines were largely offset by local increases in abundance in nearby survey sections (Figure 3.26).

Reef herons were apparently formerly much more common in the Wellington region but appear to have undergone a substantial decline from around the 1950s onwards. For example, Edgar (1978) reports that eight reef heron nests were located at Castlepoint in 1959, but a re-survey of the same location in 1975 found none. Similarly, four breeding pairs were reported to be present on Kāpiti Island in 1941 (Edgar, 1978), whereas only a single bird was observed on the island during this survey. Numbers of reef herons in Wellington Harbour have apparently been relatively low since the mid-1970s, during which time an estimated six breeding pairs were present (Edgar, 1978). Recent Wellington Harbour bird surveys carried out by Birds New Zealand, together with the results of the 2017-2018 and 2022-2023 surveys, suggest that the current breeding population of reef herons in the harbour is now less than half of this 1975 estimate. Despite these historical declines, the results of the 2017-2018 and 2022-2023 coastal bird surveys indicate that the regional matuku moana / reef heron population has now stabilised, albeit at a critically low level.

Matuku moana / reef herons appear to be exceedingly rare along much of central New Zealand's coastline. Ten adult birds were counted along 333 km of the Hawke's Bay coastline in 2024 and only a single bird was encountered along 160 km of the Manawatū-Whanganui coastline in 2025 (McArthur *et al.* 2024; Horizons Regional Council, unpublished data). In the top of the South Island, 16 birds were

encountered along 428 km of the Nelson-Tasman coastline in 2020 (McArthur *et al.* 2021; McArthur *et al.* 2022) and 57 matuku moana / reef herons were counted along the 1,500 km coastline of the Marlborough Sounds in 2006 (Bell, 2010a). Given the apparently large amount of suitable rocky shore habitat present along the coastlines of the lower North Island and upper South Island, the number of matuku moana / reef herons counted during these recent surveys along the central New Zealand coastline appears to be unnaturally low. This in turn suggests that one or more as yet unidentified environmental factors have matuku moana / reef heron populations in central New Zealand to decline to a critically low level.

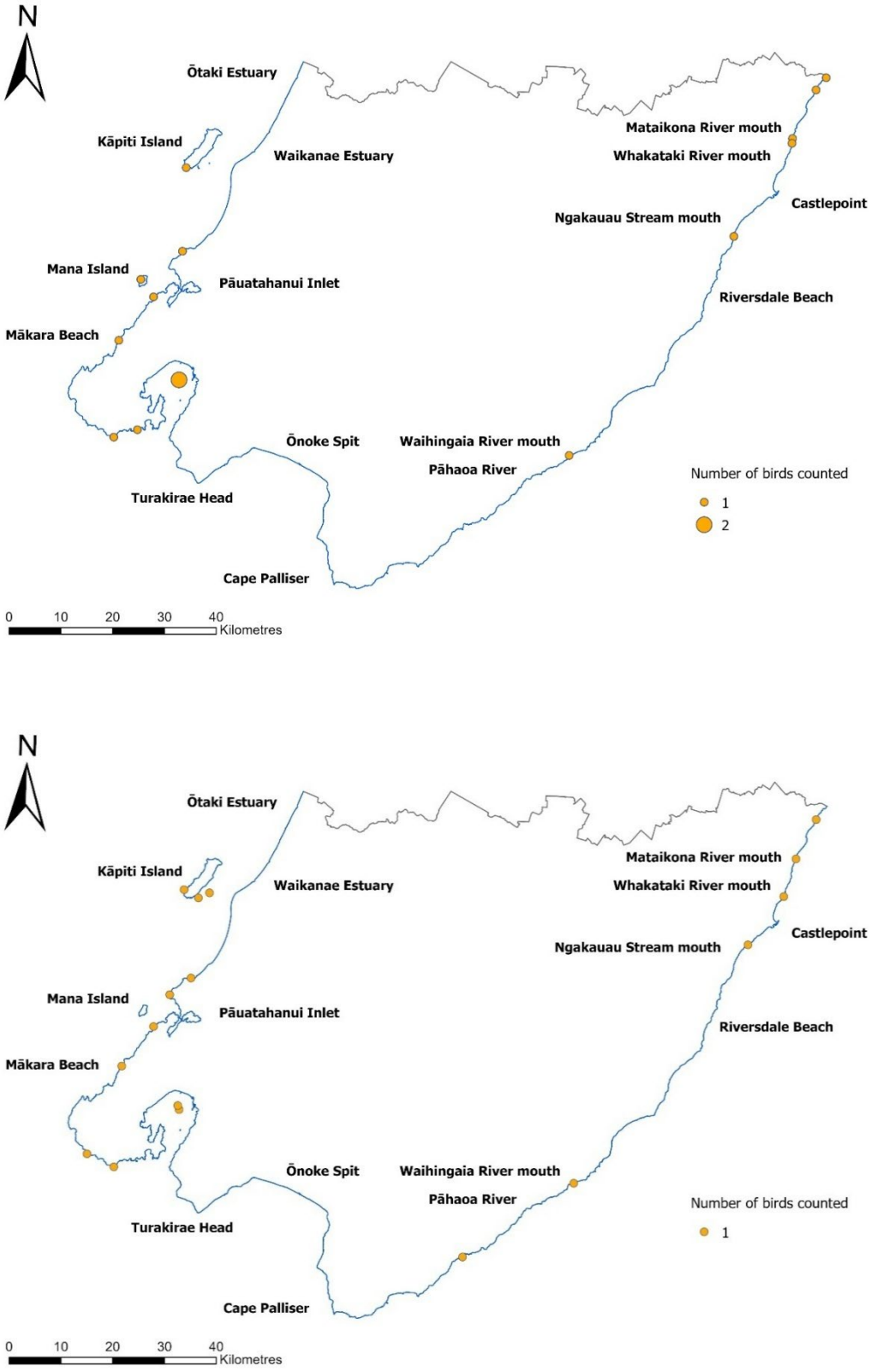


Figure 3.25: Spatial patterns in the local abundance of matuku moana / reef herons per 1 km survey section along the Wellington region coastline in 2017-2018 (top map) and in 2022-2023 (bottom map).

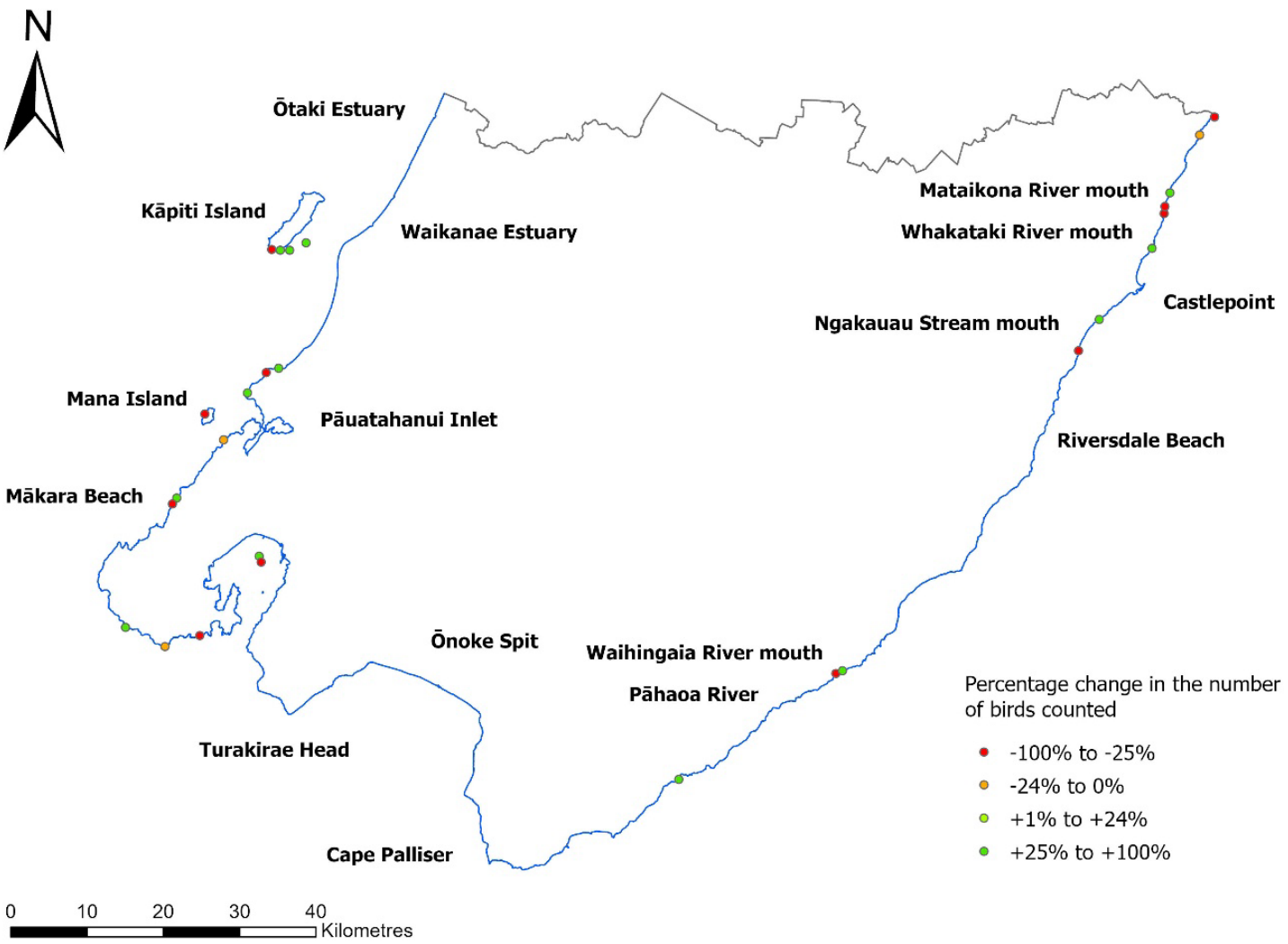


Figure 3.26: Percent change in the local abundance of matuku moana / reef herons per 1 km survey section along the Wellington region coastline between 2017-2018 and 2022-2023.

3.2.12 Kawau tikitiki / spotted shag (*Phalacrocorax punctatus*)

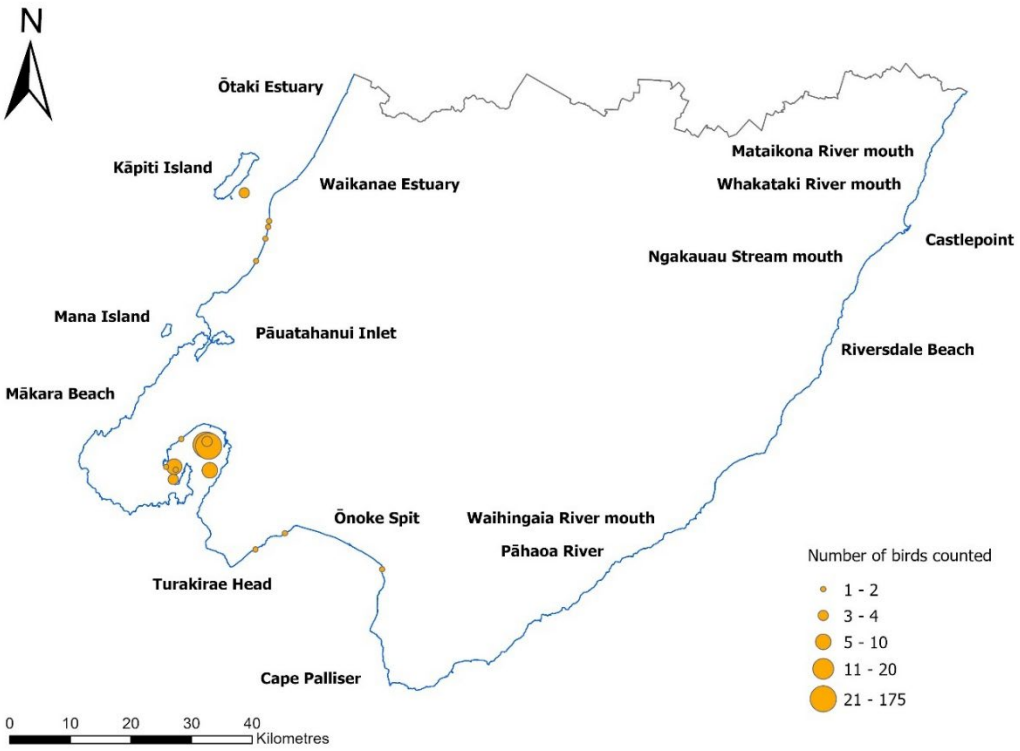
Image courtesy of Ormond Torr/NZ Birds Online

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

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

A total of 173 adult kawau tikitiki / spotted shags were counted during the 2022-2023 coastal bird survey, occupying 17 (3.8%) of the 450 1 km sections of coastline and associated estuaries and coastal lagoons surveyed. This represents a 30% decrease from the 246 adult kawau tikitiki / spotted shags counted during the 2017-2018 survey, during which this species was found to be occupying the same number of survey sections (Figure 3.27). Among the sections of coastline that were surveyed during both the 2017-2018 and 2022-2023 surveys, the mean number of kawau tikitiki / spotted shags counted per survey section declined from 0.55 birds per section to 0.38 birds per section. This 31% decline in the mean number of kawau tikitiki / spotted shags counted per section was not statistically significant however ($F_{1,898}$ = 0.12; P = 0.73; one-way ANOVA), likely due to the high level of variation between individual section counts and the low proportion of survey sections occupied by kawaupaka / little shags.

During both surveys, the vast majority of kawau tikitiki / spotted shags counted during this survey were in Te Whanganui-a-Tara / Wellington Harbour, with only a handful of birds observed elsewhere, including along the Kāpiti coast, in Palliser Bay and along the eastern Wairarapa coastline (Figure 3.27). The local abundance of kawau tikitiki / spotted shags within Te Whanganui-a-Tara / Wellington Harbour is undoubtably due to the presence of a breeding colony present on Matiu/Somes Island, the largest such colony in the Wellington region (Waugh *et al.* 2013). A small number of kawau tikitiki / spotted shags also nest on rock stacks at Port Dorset on Miramar Peninsula (e.g., Hodge 2020), the only site on the mainland Wellington region coastline where this species is known to nest (GWRC unpublished data). The local abundance of kawau tikitiki / spotted shags appears to have declined in Te Whanganui-a-Tara / Wellington Harbour since 2017, though elsewhere along the Wellington coastline local increases and declines in kawau tikitiki / spotted shags appear to be distributed more randomly (Figure 3.28).



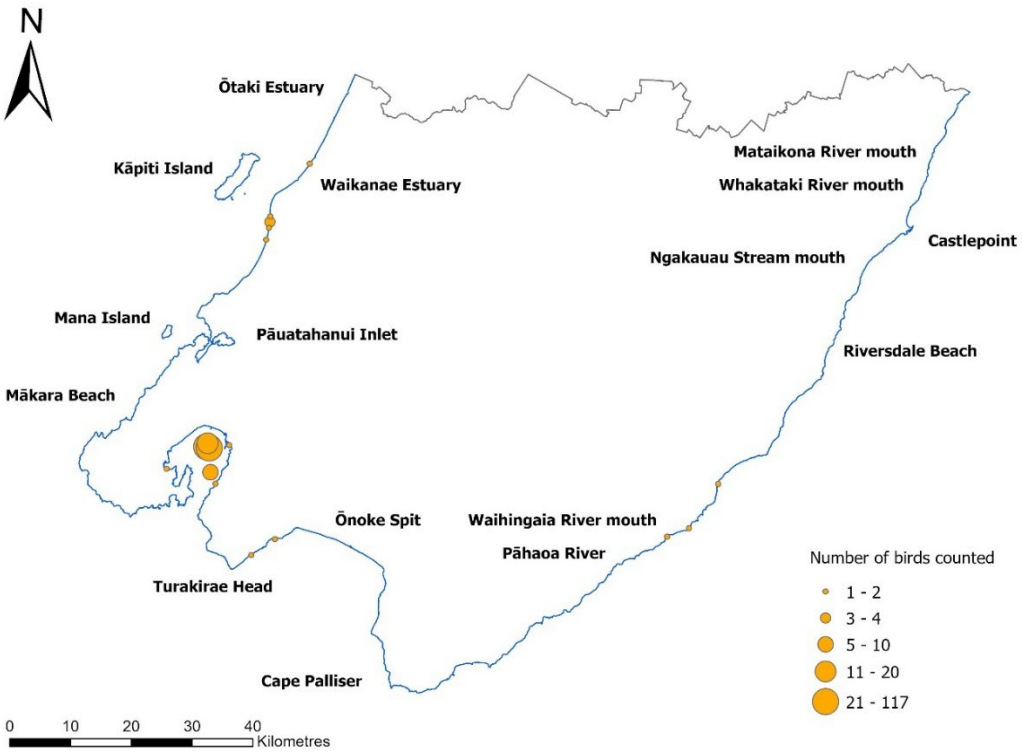


Figure 3.27: Spatial patterns in the local abundance of kawau tikitiki / spotted shags per 1 km survey section along the Wellington region coastline in 2017-2018 (top map) and in 2022-2023 (bottom map).

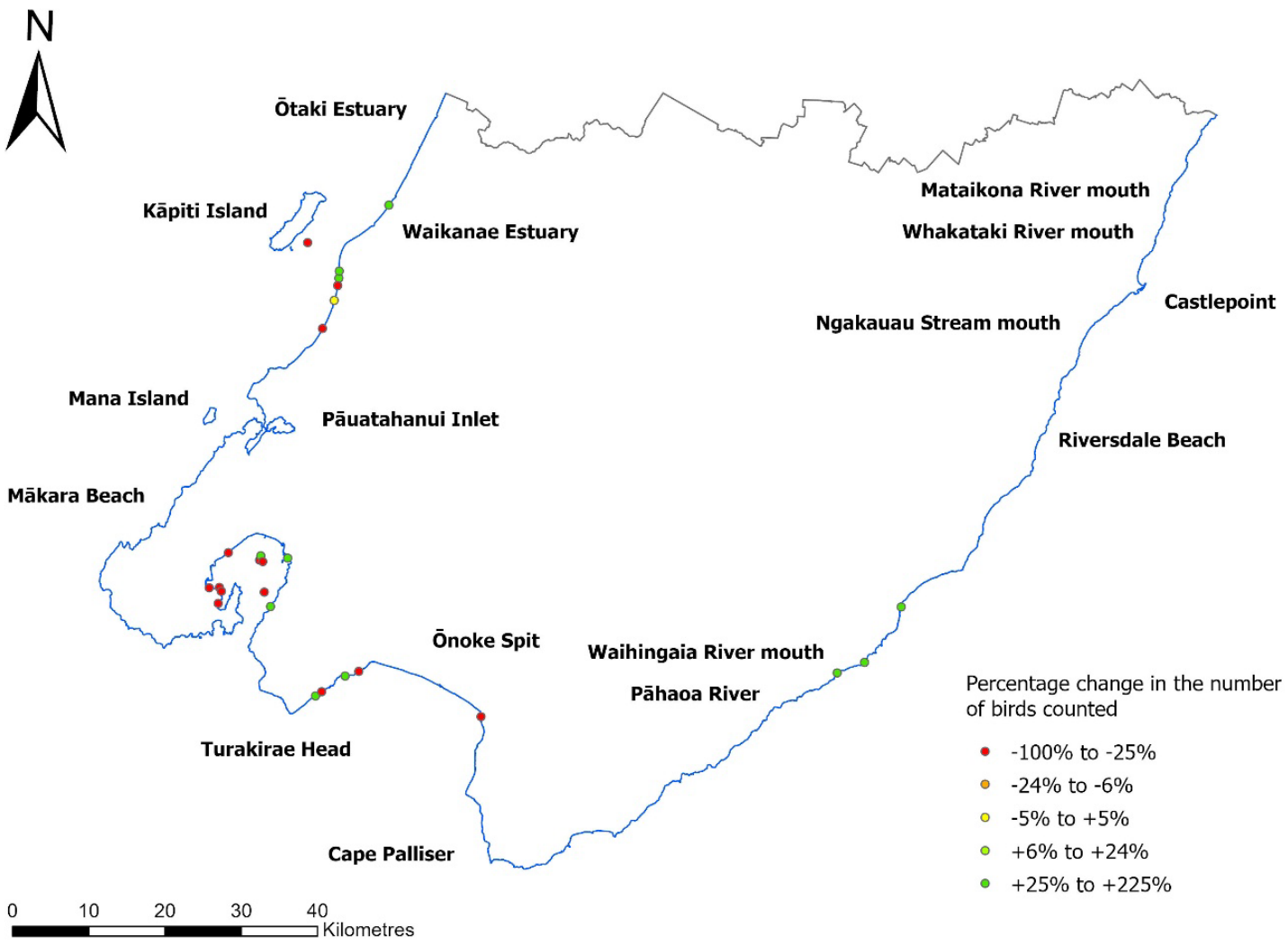


Figure 3.28: Percent change in the local abundance of kawau tikitiki / spotted shags per 1 km survey section along the Wellington region coastline between 2017-2018 and 2022-2023.

3.2.13 Tōrea pango / variable oystercatcher (*Haematopus unicolor*)

Image courtesy of Rebecca Bowater/NZ Birds Online

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

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

A total of 664 adult tōrea pango / variable oystercatchers were counted during the 2022-2023 coastal bird survey, representing a 7% decline from the 712 adult tōrea pango / variable oystercatchers counted during the 2017-2018 survey. Despite this decline in numbers, the number of 1 km survey sections occupied by tōrea pango / variable oystercatchers increased by 5% over the same period. Tōrea pango / variable oystercatchers were encountered in 236 (52%) of survey sections during 2017-2018 survey, and in 247 (55%) of survey sections during the 2022-2023 survey. (Figure 3.29; McArthur *et al.* 2019). Among the sections of coastline that were surveyed during both the 2017-2018 and 2022-2023 surveys, the mean number of tōrea pango / variable oystercatchers counted per survey section declined from 1.58 birds per section in 2017-2018 to 1.47 birds per section in 2022-2023. This 7% decline in the mean number of tōrea pango / variable oystercatchers counted per section was not statistically significant however ($F_{1,898}$ = 0.48; P = 0.49; one-way ANOVA).

Tōrea pango / variable oystercatchers were one of the most widespread coastal bird species encountered during these surveys and were relatively uniformly distributed along the Wellington region coastline. During both the 2017-2018 and 2022-2023 surveys, particularly high densities of birds were encountered along the Kāpiti coast between Paekākāriki Beach and Waikawa Estuary, and in Te Whanganui-a-Tara / Wellington Harbour, including on Matiu-Somes and Mākaro / Ward Islands. In contrast, relatively low numbers of birds were encountered between Ōrua-pouanui / Baring Head and White Rock during both surveys (Figure 3.29). Local declines in the abundance of tōrea pango / variable oystercatchers within individual 1 km survey sections appeared to be randomly distributed along the Wellington region coastline, and these local declines were largely offset by local increases in abundance in nearby survey sections (Figure 3.30).

The average density of 1.47 tōrea pango / variable oystercatchers per kilometre along the Wellington region coastline is similar to the average population densities that occur along the Hawke's Bay and Manawatū-Whanganui coastlines. An average of 1.53 oystercatchers/km was recorded along 333 km of the Hawke's Bay region coastline in 2024 (McArthur *et al.* 2024), and 1.11 oystercatchers/km were recorded along 160 km of the Manawatū/Whanganui coastline in 2025 (Horizons Regional Council, unpublished data). Tōrea pango / variable oystercatcher densities in the Wellington region are substantantially higher than the 0.49 oystercatchers/km recorded along 1,500 km of the Marlborough Sounds coastline in 2006 (Bell, 2010), but are substantially lower than the 4.11 oystercatchers/km recorded along 428 km of the the Nelson-Tasman coastline in 2020 (McArthur *et al.* 2021; McArthur *et al.* 2022). The much higher number of tōrea pango / variable oystercatchers in the Nelson-Tasman region is likely due to the much larger area of intertidal mudflat habitats present in this region, in comparison to the coastlines of the Wellington, Hawke's Bay and Manawatū-Whanganui regions, and in the Marlborough Sounds.

Nationwide, tōrea pango / variable oystercatcher numbers have increased steadily in recent decades. The mean number of tōrea pango / variable oystercatchers recorded during Birds New Zealand winter wader counts increased by 77% between 1983-1994 and 2005-2019, from a mean of 1,393 birds recorded annually during nationwide counts carried out between 1983-1994 to a mean of 2,802 birds recorded annually during counts carried out between 2005-2019 (Riegen & Sagar, 2020). Some of this recent increase in numbers is likely to be a consequence of the improved management of New Zealand dotterel breeding habitats in the northern North Island, although similar increases have also been observed in other parts of New Zealand, including the Nelson-Tasman region (Riegen & Sagar, 2020). Given the widespread distribution of tōrea pango / variable oystercatchers, there is considerable uncertainty regarding the national and global population size of this endemic shorebird, but the most recent NZTCS national threat ranking assessment is based on an estimated national population of between 5,000 and 20,000 adult birds[6]. A total of 3,840 adult tōrea pango / variable oystercatchers have been counted along 2,871 km of coastline in the Nelson, Tasman, Marlborough, Wellington, Hawke's Bay and Manawatū / Whanganui regions since 2010, which comprises 19% of New Zealand's 15,000 km coastline (Bell, 2010b; McArthur *et al.* 2021; McArthur *et al.* 2022; McArthur *et al.* 2024; Horizons Regional Council, unpublished data). Assuming mean tōrea pango / variable oystercatcher densities in central New Zealand are representative of mean densities across the entire country, this would indicate a national population size of 20,210 birds.

[6] Source: NZTCS and licensed by DOC for reuse under the Creative Commons Attribution 4.0 International licence.

Figure 3.29: Spatial patterns in the local abundance of tōrea pango / variable oystercatchers per 1 km survey section along the Wellington region coastline in 2017-2018 (top map) and in 2022-2023 (bottom map).

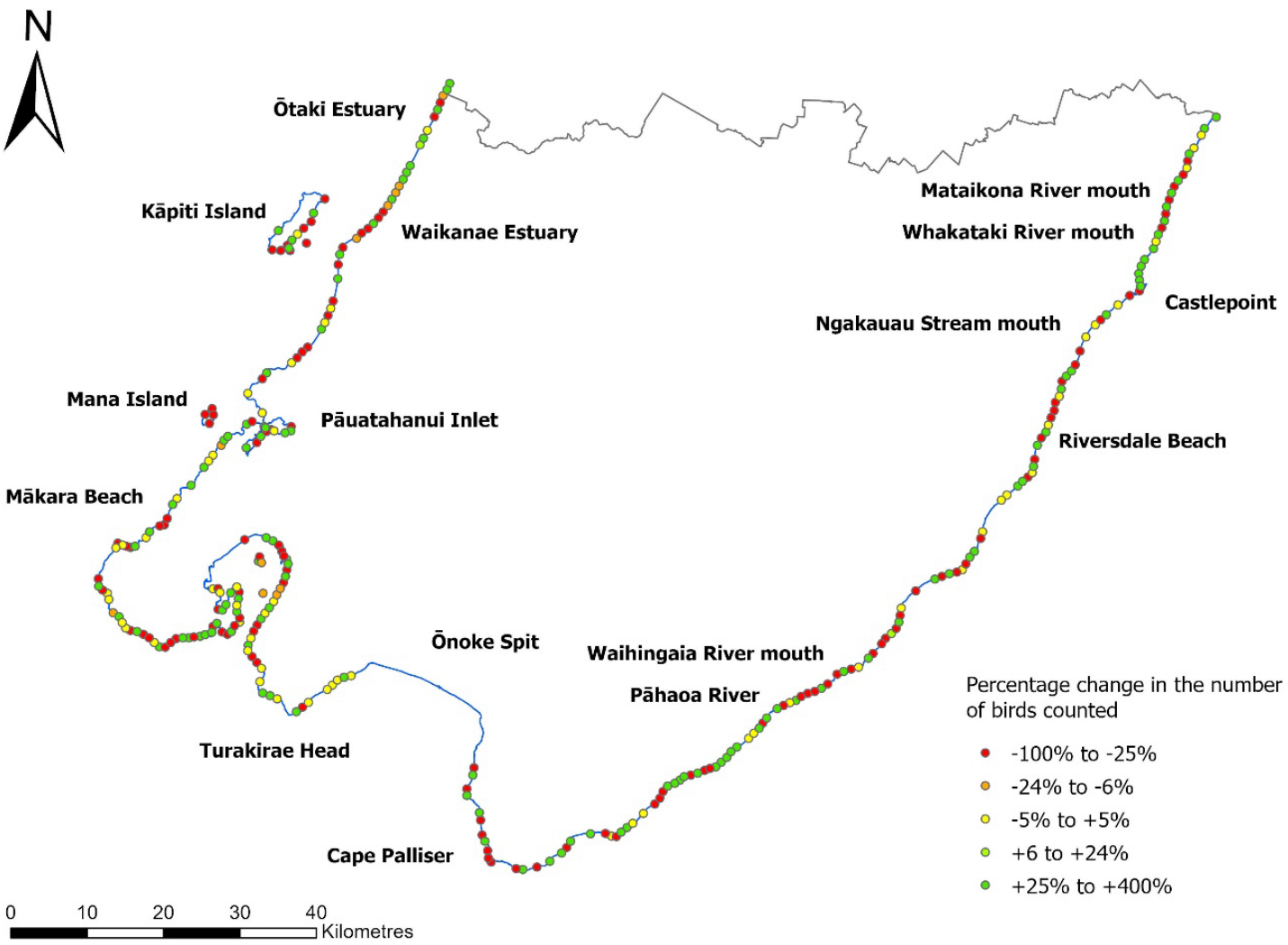


Figure 3.30: Percent change in the local abundance of kawau tōrea pango / variable oystercatchers per 1 km survey section along the Wellington region coastline between 2017-2018 and 2022-2023.

3.2.14 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)

The tara / white-fronted tern was one of the most abundant and widespread coastal bird species encountered during the 2022-2023 bird survey. A total of 3,196 adult tara / white-fronted terns were counted during the 2022-2023 survey, occupying 110 (24%) of the 450 1 km sections of coastline and associated estuaries and coastal lagoons surveyed. This is a 193% increase from the 1,088 adult tara / white-fronted terns counted during the 2017-2018 survey, during which this species was found to be occupying 98 (22%) of the 450 sections of coastline surveyed (Figure 3.31). Among the sections of coastline that were surveyed during both the 2017-2018 and 2022-2023 surveys, the mean number of tara / white-fronted terns counted per survey section increased from 2.41 birds per section in 2017-2018 to 7.10 birds per section in 2022-2023. This 195% Increase in the mean number of tara / white-fronted terns counted per section was statistically significant ($F_{1,898}$ = 6.02; P = 0.01; one-way ANOVA). This significant increase in the number of tara / white-fronted terns counted during these surveys is likely to be a consequence of the fact that the 2022-2023 survey was completed 1-2 months later in the season than the 2017-2018 survey. Tara / white-fronted tern numbers in Te Whanganui-a-Tara / Wellington Harbour are close to their annual minimum between November and January each year, but numbers subsequently climb to reach an annual peak between March and June each year, just prior to their autumn migration to Australia, due to a seasonal influx of birds dispersing into the Wellington region from other parts of New Zealand (Robertson 1992). It is likely therefore, that the bulk of the tara / white-fronted terns counted during the 2017-2018 survey were locally-breeding birds, whereas the 2022-2023 count also included an influx of birds from other parts of New Zealand.

During both surveys, tara / white-fronted terns were not uniformly distributed along the Wellington region coastline, instead appearing to be concentrated at many of the larger estuaries and river mouths where birds typically congregate to roost, and at sites supporting nesting colonies (Figure 3.31). Tara / white-fronted terns appeared to be relatively scarce along the south-west coastline of the Wellington region between Sinclair Head and Mākara Beach during both the 2017-2018 and 2022-2023 surveys. 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 this stretch of the Wellington coastline provides lower habitat quality for this species in comparison other stretches of the coast. Local declines and increases in tara / white-fronted terns along the Wellington region coastline appeared to be more or less randomly distributed (Figure 3.32).

During the 2022-2023 coastal bird survey tara / white-fronted terns were found nesting at two locations along the Wellington region coastline, at the Waikanae Estuary and on the Te Awaiti coast near Stony Bay. Tara / white-fronted terns were observed breeding at five further locations during the

2017-2018 coastal bird survey, on Kāpiti, Mana and Mākaro/Ward Islands, as well as at Point Dorset (Miramar Peninsula) and at Honeycomb Rock near Glenburn (McArthur *et al.* 2019). This brings the number of sites at which tara / white-fronted terns have been observed nesting in the Wellington region in recent years to seven. During the 2017-2018 coastal bird survey, a total of 149 occupied tara / white-fronted tern nests were counted along the Wellington region coastline, providing a regional breeding population estimate of 298 birds (McArthur *et al.* 2019). Unfortunately, the 2022-2023 survey was carried out 1-2 months later in the season and the tara / white-fronted tern nesting colonies had either disbanded or had passed peak incubation. For this reason, it wasn't possible to obtain an accurate regional breeding population estimate from the 2022-2023 survey dataset.

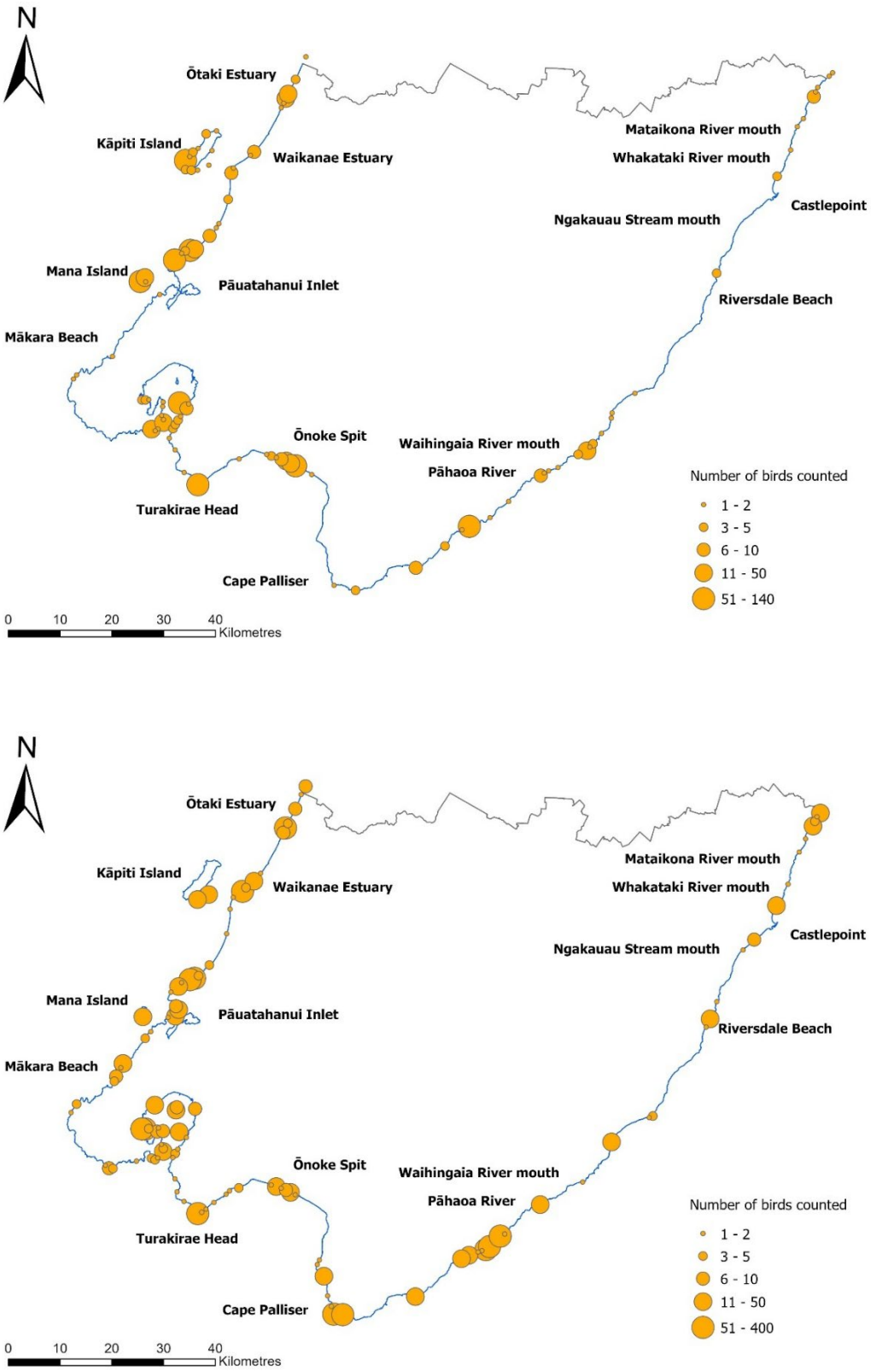


Figure 3.31: Spatial patterns in the local abundance of tara / white-fronted terns per 1 km survey section along the Wellington region coastline in 2017-2018 (top map) and in 2022-2023 (bottom map).

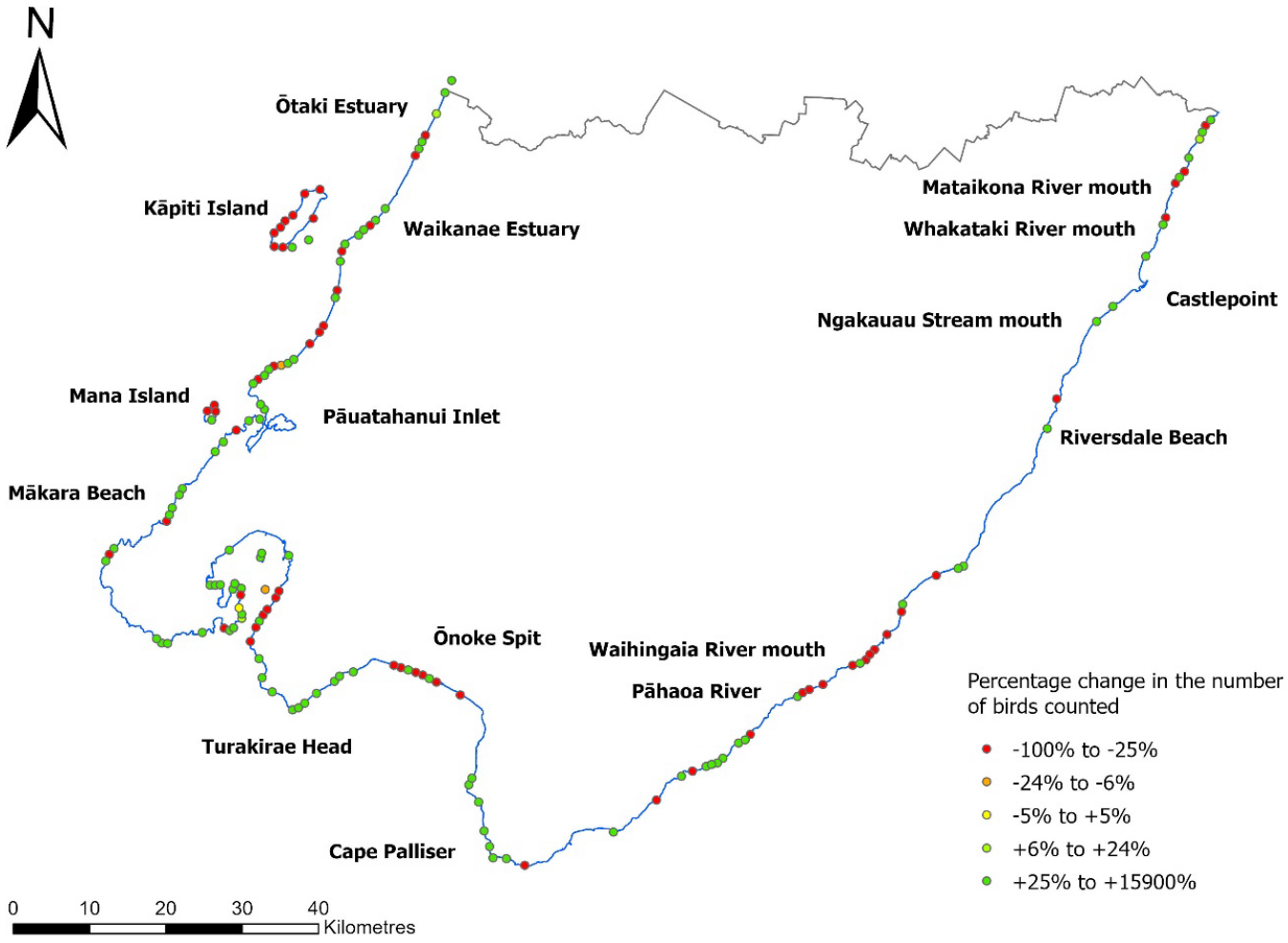


Figure 3.32: Percent change in the local abundance of kawau tara / white-fronted terns per 1 km survey section along the Wellington region coastline between 2017-2018 and 2022-2023.

4. Discussion

4.1 Changes in the diversity, abundance and distribution of coastal birds

The results of this survey indicate that there has been no overall change in the total diversity or abundance of coastal birds along the Wellington region coastline since 2017-2018. The mean total abundance of indigenous birds counted per survey section is also unchanged, however the mean number of indigenous bird species counted per survey section has increased significantly over the same period. This increase in mean indigenous species diversity, in the absence of a corresponding increase in indigenous bird abundance, indicates that a number of bird species have increased their distribution along the Wellington region coastline since 2017-2018. Those species that have exhibited the largest increases in distribution over this period include black-fronted dotterel (a 425% increase in the number of occupied survey sections), tētē-moroiti / grey teal (a 367% increase), tūturiwhatu / NZ dotterel (a 143% increase, māpunga / black shag (a 94% increase), poaka / pied stilt (a 64% increase), taranui / Caspian tern (a 43% increase), pīhoihoi / New Zealand pipit (a 38% increase), tōrea / South Island pied oystercatcher (a 33% increase), kāruhiruhi / pied shag (a 22% increase) and matuku moana / reef heron (a 21% increase) (Appendix 1). It is unlikely that there is any single environmental factor that has caused these increases in the distribution of these indigenous bird species, instead a number of different factors are likely to be at play. For example, the ongoing expansion in the distribution of New Zealand dotterels is likely to be a consequence of ongoing conservation management work being carried out at key local breeding sites such as Riversdale Beach and the Waikanae Estuary, and at sites elsewhere in the North Island. Black-fronted dotterel numbers along the Wellington region coastline may be due to birds having been displaced from Wairarapa rivers due to habitat disturbance caused by heavy flooding in 2022. Increases in the distribution of species such as tōrea / SI pied oystercatcher and taranui / Caspian tern may simply be a reflection of the fact that the 2022-2023 survey was conducted 1-2 months later in the year than the 2017-2019 survey, at a time of the year when a larger number of birds may have dispersed into the Wellington region from breeding sites elsewhere in the country (Robertson, 1992; Riegen & Sagar, 2020). Increases in the distribution of species such as poaka / pied stilts may reflect chance differences between the two surveys in the state of tide along key sections of coastline surveyed.

The 25% decline in the total number of pōhowera / banded dotterels counted along the Wellington region coastline is of considerable concern, for two reasons. Firstly, a 25% decline over five years represents a mean annual population decline of 7.9%, which between two and six times the current estimated annual rate of decline for the national pōhowera / banded dotterel population (O'Donnell & Monks, 2020). Secondly, the decline in pōhowera / banded dotterels along the Wellington region coastline is mirrored by an 18% decline in the number of bird breeding along 211 km of the Wellington region's rivers over the same period (McArthur & Thomas, 2022; GWRC, unpublished data), equating to a 3.9% decline per annum. Combining these two data sources, it is estimated that the Wellington region pōhowera / banded dotterel population has declined by 21% since 2017-2018, at a mean annual rate of decline of 4.6%. This represents a 0.8% decline in the national (and global) pōhowera / banded dotterel population equates to between 1.2 and 3.3 times the estimated national annual rate of decline for this species. If this rate of decline continues indefinitely, it would result in a halving in the number of pōhowera / banded dotterels breeding in the Wellington region every 15-16 years. It

appears unlikely that one single environmental factor is responsible for this decline in the regional pōhowera / banded dotterel population. Instead, it's likely that several agents of decline are working simultaneously, including the ongoing impacts of mammalian predators; declines in habitat quality caused by coastal erosion, river flooding and invasive weeds; and disturbance caused by human activities (McArthur, 2020; McArthur & Jones, 2022; Mcarthur, 2024; McArthur & Thomas, 2024). This being the case, it's likely that conservation management actions designed to reduce the impacts of a range of threats to pōhowera / banded dotterels will need to be implemented across a network of key sites in the Wellington region to reverse this declining population trend.

The 2022-2023 survey revealed a number of opportunities to further improve field survey techniques to increase the accuracy of the regional population size and trend estimates obtained. The 2022-2023 coastal survey was carried out 1-2 months later in the year than the 2017-2018 season, and as a result the latter survey was carried out at a time of year when tarāpunga / red-billed gulls and tara / white-fronted terns had passed peak incubation. This difference in timing meant that it was not possible to generate accurate regional breeding population estimates for these two species, by using the number of occupied nests as a measure of the number of breeding pairs present in the region. To avoid this problem reoccurring, it will be important to schedule future surveys to be carried out in November-December each year, to coincide with the peak incubation period for these two species. Over the past 5-10 years, there have been substantial improvements in the availability of relatively inexpensive unmanned aerial vehicles (UAVs), and these are being increasingly used to conduct wildlife surveys in New Zealand (e.g. Bell & Harborne, 2019; Stone & Parker, 2022). A number of the gull, tern and shag nesting colonies that have been located during these surveys are relatively inaccessible on foot, making it difficult to reach a suitable viewpoint from which to carry out an accurate count of nests. The use of a UAV during future coastal bird surveys may improve the accuracy of nest counts at these colonies, resulting in further improvements in the accuracy of regional population size estimates derived from these survey data. Four of the five shag species that occur in the Wellington region (namely kawaupaka / little shags, māpunga / black shags, kawau tūī / little black shags, and kāruhiruhi / pied shags) breed at nesting colonies situated both along the coastline and further inland, on rivers, ponds and lakes. These inland nesting colonies are not currently being systematically surveyed or monitored, hampering GWRC's ability to generate regional population estimates for these species from the coastal bird survey data alone. For this reason, conducting counts of the number of occupied nests at all of the Wellington region's shag colonies (both coastal and inland colonies) during future coastal bird surveys will greatly improve resulting population size and trend estimates for these species, at little or no additional cost.

4.2 Maintaining and improving the informed management of coastal bird habitats

In recent years, Greater Wellington Regional Council has invested considerable time and resources into quantifying and mapping the indigenous bird values of coastal and freshwater habitats in the Wellington region, becoming a sector leader in the use of regional-scale surveys to quantify bird abundance and distribution. Furthermore, GWRC has made extensive use of the resulting datasets to inform council policy, improve the processing of resource consent applications, assess regional threat rankings, improve oiled wildlife response preparedness and prioritise conservation management

activities. The completion of the 2022-2023 survey creates a number of opportunities to maintain and improve this evidence-based management of coastal bird habitats in the Wellington region, including:

- Reviewing and updating the list of "habitats of significance" listed in Schedule F2c of Wellington's Natural Resources Plan. This exercise should consist of two components: Firstly, a re-evaluation of the number and location of "habitats of significance" listed in Schedule F2c, and secondly, a comprehensive update of the description of the indigenous bird values and critical periods for each of these identified sites.

- Ensuring that relevant population size and trend data collected during the 2017-2018 and 2022-2023 coastal bird surveys are used to inform the next re-assessment of the **national** threat rankings of New Zealand's birds, scheduled to be carried out in 2026.

- Ensuring that relevant population size and trend data collected during the 2017-2018 and 2022-2023 surveys be used to inform the next re-assessment of the **regional** threat rankings of Wellington's birds, scheduled to be carried out by 2028.

- Collaborating with MNZ to build a GIS database describing the summer distribution and abundance of coastal birds considered vulnerable to marine oil spills, utilising the bird distribution and abundance collected during the 2017-2018 and 2022-2023 surveys. Such a database could include layers that: 1) identify the location and approximate sizes of nesting colonies of gulls, terns and shags; 2) maps the relative abundance of breeding shorebirds, and 3) identifies the location and approximate sizes of known roost sites of coastal bird species.

It is recommended that this regional coastal bird survey continues to be repeated at five-yearly intervals, with the next survey scheduled to be carried out over the summers of 2027 and 2028. This will allow GWRC to continue to maintain an up-to-date picture of spatial patterns in the diversity and abundance of bird species along the Wellington region coastline, and to continue to monitor the regional population trends of all Nationally Threatened or At-Risk bird species that are largely restricted to coastal habitats in the Wellington region.

4.3 The bigger picture: An opportunity for interagency collaboration

Since 2019, all three lower North Island regional councils (namely Hawke's Bay Regional Council, Horizons Regional Council and Greater Wellington Regional Council) have carried out complete bird surveys along their respective regional coastlines, and along all the gravelly rivers present within each region. These survey efforts combined have succeeded in creating the first ever complete picture of the distribution and abundance of coastal birds and Nationally Threatened or At-Risk inland-breeding shorebirds for the entire lower North Island. All three regional councils have expressed a commitment in principle to continue these surveys on an ongoing basis, to monitor regional population trends and future changes in bird abundance. This being the case, it is recommended that GWRC investigates the feasibility, costs and benefits of entering a more formal collaboration with both Hawke's Bay Regional Council and Horizons Regional Council with the aim of maintaining this complete picture of the population size, trends and distribution of coastal birds and inland-breeding shorebirds in the lower North Island. Such a collaboration could include, but not be limited to:

- A shared commitment to deliver an agreed-upon schedule of regional-scale coastal and riverine bird surveys within each council's respective regions

- Working together to create a single GIS database to improve data storage, facilitate data sharing between the three collaborating councils and other agencies such as DOC and MNZ, and to improve the accessibility of these datasets to the general public, special interest groups and resource consent applicants.

- Working together to communicate the results of these surveys to the general public and to special interest groups

- Working together, and with partner agencies, special interest groups and the general public, to utilise these datasets to inform the management of these species, and their habitats, across the lower North Island.

- Working together to solve shared problems relating to the management of coastal and riverine habitats for coastal birds and shorebirds, such as co-funding an investigation to quantify the flight initiation distances of riverbed-nesting shorebirds, to better inform the size of 'exclusion zones' to be maintained around shorebird nests during commercial gravel extraction and flood management works.

5. Recommendations

Based on the results described in this report, it is recommended that Greater Wellington Regional Council considers adopting the following recommendations:

Updating Schedule F2c of Wellington's Natural Resources Plan

- That the data collected during the 2022-2023 survey be used to review and update the list of "habitats of significance" listed in Schedule F2c of Wellington's Natural Resources Plan. This review should consist of two components: Firstly, a re-evaluation of the number and location of "habitats of significance" listed in Schedule F2c, and secondly a comprehensive update of the description of the indigenous bird values and critical periods for each of these identified sites.

Informing national and regional threat rankings for indigenous birds

- That relevant population size and trend data collected during the 2017-2018 and 2022-2023 surveys be used to inform the next re-assessment of the **national** threat rankings of New Zealand's birds, scheduled to be carried out in 2026.

- That relevant population size and trend data collected during the 2017-2018 and 2022-2023 surveys be used to inform the next re-assessment of the **regional** threat rankings of Wellington's birds, scheduled to be carried out by 2028.

Improving Wellington's oiled wildlife incident response readiness

- That GWRC considers collaborating with MNZ to build a GIS database describing the summer distribution and abundance of coastal birds considered vulnerable to marine oil spills, utilising the bird distribution and abundance collected during the 2017-2018 and 2022-2023 surveys. Such a database could include layers that: 1) identify the location and approximate sizes of nesting colonies of gulls, terns and shags; 2) maps the relative abundance of breeding shorebirds, and 3) identifies the location and approximate sizes of known roost sites of coastal bird species.

Future surveys

- That this regional coastal bird survey continues to be repeated at five-yearly intervals, with the next survey scheduled to be carried out over the summers of 2027 and 2028. This will allow GWRC to continue to maintain an up-to-date picture of spatial patterns in the diversity and abundance of bird species along the Wellington region coastline, and to continue to monitor the regional population trends of all Nationally Threatened or At-Risk bird species that are largely restricted to coastal habitats in the Wellington region.

- That the 2027-2028 survey be carried out during the months of November or December, to ensure that the survey is carried out at the time of year when gull and tern colonies are likely to be at peak incubation.

- That during the 2027-2028 survey consideration be given to using unmanned aerial vehicle (drone) technology to carry out more accurate counts of the number of occupied nests in tarāpunga / red-billed gull and tara / white-fronted tern colonies found along the Wellington region coastline.

- That the 2027-2028 survey includes counts of the number of occupied nests at all known inland shag colonies, to improve GWRC's ability to estimate population size and trends for Kawaupaka / little shags, māpunga / black shags, kawau tūī / little black shags, and kāruhiruhi / pied shags in the Wellington region. These additional shag colonies surveys should be able to be accommodated within the existing 2027-2028 coastal bird survey budget.

Inter-region collaboration

- That GWRC investigates the feasibility, costs and benefits of entering into a formal collaboration with both Hawke's Bay Regional Council and Horizons Regional Council with the aim of maintaining a complete picture of the population size, trends and distribution of coastal birds and inland-breeding shorebirds in the lower North Island. Such a collaboration could include, but not be limited to:

    - A shared commitment to deliver an agreed-upon schedule of regional-scale coastal and riverine bird surveys
    - Working together to create a single GIS database to improve data storage, facilitate data sharing between regional councils and to improve the accessibility of these datasets to the public, special interest groups and resource consent applicants.
    - Working together to communicate the results of these surveys to the public
    - Working together to utilise these datasets to inform the management of these species, and their habitats, across the lower North Island.

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Appendix

The following table contains a list of all of the bird species encountered during the Wellington region coastal bird surveys carried out in 2017-2018 and 2022-2023. Scientific names, common names (both Māori and English) and the taxonomic order in which the species appear in this list all follow those used in the sixth edition of 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 NZTCS ranking	Regional NZTCS ranking	Total number of individuals counted		Number (and percentage) of survey sections in which species were observed	
					2017-2018	2022-2023	2017-2018	2022-2023
kakīānau	black swan	*Cygnus atratus*	Not Threatened	Not Threatened	422	542	17 (3.8%)	33 (7.3%)
kuihi	greylag goose	*Anser anser*	Introduced and Naturalised	Introduced and Naturalised	26	177	3 (0.7%)	5 (1.1%)
kuihi	Canada goose	*Branta canadensis*	Introduced and Naturalised	Introduced and Naturalised	240	396	20 (4.4%)	20 (4.4%)
pūtangitangi	paradise shelduck	*Tadorna variegata*	Not Threatened	Not Threatened	203	158	38 (8.4%)	33 (7.3%)

Māori name	Common name	Scientific name	National NZTCS ranking	Regional NZTCS ranking	Total number of individuals counted		Number (and percentage) of survey sections in which species were observed	
					2017-2018	2022-2023	2017-2018	2022-2023
tētē-moroiti	grey teal	*Anas gracilis*	Not Threatened	Not Threatened	7	105	3 (0.7%)	14 (3.1%)
rakiraki	mallard	*A. platyrhynchos*	Introduced and Naturalised	Introduced and Naturalised	220	385	44 (9.7%)	48 (10.6%)
pārera	grey duck	*A. superciliosa*	Nationally Vulnerable	Regionally Critical	0	2	0 (0%)	1 (0.2%)
kuruwhengi	Australasian shoveler	*Spatula rhynchotis*	Not Threatened	Not Threatened	4	7	2 (0.4%)	3 (0.7%)
pāpango	New Zealand scaup	*Aythya novaeseelandiae*	Not Threatened	Regionally Naturally Uncommon	7	9	1 (0.2%)	1 (0.2%)
tikaokao	California quail	*Callipepla californica*	Introduced and Naturalised	Introduced and Naturalised	9	9	5 (1.1%)	3 (0.7%)
	common pheasant	*Phasianus colchicus*	Introduced and Naturalised	Introduced and Naturalised	4	4	4 (0.9%)	4 (0.9%)

Māori name	Common name	Scientific name	National NZTCS ranking	Regional NZTCS ranking	Total number of individuals counted		Number (and percentage) of survey sections in which species were observed	
					2017-2018	2022-2023	2017-2018	2022-2023
kererū aropari	rock pigeon	*Columba livia*	Introduced and Naturalised	Introduced and Naturalised	95	221	22 (4.9%)	29 (6.4%)
kererū	New Zealand pigeon (kererū)	*Hemiphaga novaeseelandiae*	Not Threatened	Not Threatened	5	7	3 (0.7%)	4 (0.9%)
pīpīwharauroa	shining cuckoo	*Chrysococcyx lucidus*	Not Threatened	Not Threatened	3	0	3 (0.7%)	0 (0%)
koekoeā	long-tailed cuckoo	*Eudynamys taitensis*	Nationally Vulnerable	Regionally Endangered	1	0	1 (0.2%)	0 (0%)
pūkeko	pukeko	*Porphyrio melanotus*	Not Threatened	Not Threatened	2	13	1 (0.2%)	5 (1.1%)
weka	weka	*Gallirallus australis*	At Risk, Relict	Regionally Vulnerable	0	5	0 (0%)	3 (0.7%)
tōrea pango	variable oystercatcher	*Haematopus unicolor*	At Risk, Recovering	Regionally Endangered	712	664	236 (52.1%)	247 (54.5%)
tōrea	South Island pied oystercatcher	*H. finschi*	At Risk, Declining	Migrant	21	43	9 (2.0%)	12 (2.6%)

Māori name	Common name	Scientific name	National NZTCS ranking	Regional NZTCS ranking	Total number of individuals counted		Number (and percentage) of survey sections in which species were observed	
					2017-2018	2022-2023	2017-2018	2022-2023
poaka	pied stilt	*Himantopus himantopus*	Not Threatened	Not Threatened	171	279	33 (7.3%)	54 (11.9%)
	black-fronted dotterel	*Charadrius melanops*	At Risk, Naturally Uncommon	Regionally Naturally Uncommon	8	42	4 (0.9%)	21 (4.6%)
	spur-winged plover	*Vanellus miles*	Not Threatened	Not Threatened	796	418	114 (25.2%)	109 (24.1%)
pohowera	banded dotterel	*Anarhynchus bicinctus*	At Risk, Declining	Regionally Endangered	346	258	58 (12.8%)	42 (9.3%)
ngutu pare	wrybill	*A. frontalis*	Nationally Increasing	Regionally Critical	0	4	0 (0%)	2 (0.4%)
tūturiwhatu	New Zealand dotterel	*A. obscurus*	Nationally Increasing	Regionally Critical	17	33	7 (1.5%)	17 (3.8%)
kuaka	bar-tailed godwit	*Limosa lapponica*	At Risk, Declining	Regionally Critical	9	17	3 (0.7%)	4 (0.9%)
	ruddy turnstone	*Arenaria interpres*	Migrant	Vagrant	1	0	1 (0.2%)	0 (0%)
	Arctic skua	*Stercorarius parasiticus*	Migrant	Migrant	1	2	1 (0.2%)	2 (0.4%)

Māori name	Common name	Scientific name	National NZTCS ranking	Regional NZTCS ranking	Total number of individuals counted		Number (and percentage) of survey sections in which species were observed	
					2017-2018	2022-2023	2017-2018	2022-2023
tarāpunga	red-billed gull	*Chroicocephalus novaehollandiae*	At Risk, Declining	Regionally Vulnerable	5255	3585	273 (60.3%)	288 (63.6%)
tarāpuka	black-billed gull	*C. bulleri*	At Risk, Declining	Regionally Critical	16	9	9 (2.0%)	6 (1.3%)
karoro	Southern black-backed gull	*L. dominicanus*	Not Threatened	Not Threatened	6146	4902	427 (94.3%)	435 (96.0%)
taranui	Caspian tern	*Hydroprogne caspia*	Nationally Vulnerable	Regionally Critical	45	55	30 (6.6%)	43 (9.5%)
tara	white-fronted tern	*Sterna striata*	At Risk, Declining	Regionally Endangered	1088	3196	98 (21.6%)	110 (24.3%)
kororā	little penguin	*Eudyptula minor*	At Risk, Declining	Regionally Vulnerable	2	2	2 (0.4%)	1 (0.2%)
pāngurunguru	Northern giant petrel	*Macronectes halli*	At Risk, Recovering	Migrant	0	3	0 (0%)	1 (0.2%)
rako	Buller's shearwater	*Ardenna bulleri*	At Risk, Declining	Migrant	0	48	0 (0%)	2 (0.4%)
pakahā	fluttering shearwater	*P. gavia*	At Risk, Relict	Regionally Critical	2	476	1 (0.2%)	20 (4.4%)

Māori name	Common name	Scientific name	National NZTCS ranking	Regional NZTCS ranking	Total number of individuals counted		Number (and percentage) of survey sections in which species were observed	
					2017-2018	2022-2023	2017-2018	2022-2023
tākapu	Australasian gannet	*Morus serrator*	Not Threatened	Migrant	253	111	90 (19.9%)	76 (16.8%)
kawaupaka	little shag	*Microcarbo melanoleucos*	At Risk, Relict	Regionally Endangered	125	159	85 (18.8%)	94 (20.8%)
māpunga	black shag	*Phalacrocorax carbo*	At Risk, Relict	Regionally Critical	148	173	78 (17.2%)	83 (18.3%)
kāruhiruhi	pied shag	*P. varius*	At Risk, Recovering	Regionally Vulnerable	474	439	125 (27.6%)	153 (33.8%)
kawau tūī	little black shag	*P. sulcirostris*	At Risk, Naturally Uncommon	Regionally Endangered	10	4	8 (1.8%)	3 (0.7%)
kawau tikitiki	spotted shag	*P. punctatus*	Nationally Vulnerable	Regionally Critical	246	173	17 (3.8%)	17 (3.8%)
matuku moana	white-faced heron	*Egretta novaehollandiae*	Not Threatened	Not Threatened	305	278	121 (26.7%)	140 (30.9%)
matuku moana	reef heron	*E. sacra*	Nationally Endangered	Regionally Critical	15	17	14 (3.1%)	17 (3.8%)

Māori name	Common name	Scientific name	National NZTCS ranking	Regional NZTCS ranking	Total number of individuals counted		Number (and percentage) of survey sections in which species were observed	
					2017-2018	2022-2023	2017-2018	2022-2023
kotuku ngutupapa	royal spoonbill	*Platalea regia*	At Risk, Naturally Uncommon	Regionally Endangered	54	70	11 (2.4%)	14 (3.1%)
kāhu	swamp harrier	*Circus approximans*	Not Threatened	Not Threatened	19	31	18 (4.0%)	28 (6.2%)
kōtare	New Zealand kingfisher	*Todiramphus sanctus*	Not Threatened	Not Threatened	11	33	10 (2.2%)	20 (4.4%)
kārearea	New Zealand falcon	*Falco novaeseelandiae*	Nationally Increasing	Regionally Critical	1	0	1 (0.2%)	0 (0%)
kākā	kaka	*Nestor meridionalis*	At Risk, Recovering	Regionally Recovering	5	0	3 (0.7%)	0 (0%)
kākā uhi whero	eastern rosella	*Platycercus eximius*	Introduced and Naturalised	Introduced and Naturalised	0	2	0 (0%)	1 (0.2%)
kākāriki	red-crowned parakeet	*Cyanoramphus novaezelandiae*	At Risk, Relict	Regionally Vulnerable	2	8	2 (0.4%)	2 (0.4%)
kākāriki	yellow-crowned parakeet	*C. auriceps*	At Risk, Declining	Regionally Endangered	2	0	2 (0.4%)	0 (0%)

Māori name	Common name	Scientific name	National NZTCS ranking	Regional NZTCS ranking	Total number of individuals counted		Number (and percentage) of survey sections in which species were observed	
					2017-2018	2022-2023	2017-2018	2022-2023
korimako	bellbird	*Anthornis melanura*	Not Threatened	Not Threatened	13	11	10 (2.2%)	10 (2.2%)
tūī	tūī	*Prosthemadera novaeseelandiae*	Not Threatened	Not Threatened	105	97	71 (15.7%)	61 (13.5%)
riroriro	grey warbler	*Gerygone igata*	Not Threatened	Not Threatened	30	72	30 (6.6%)	62 (13.7%)
tīeke	North Island saddleback	*Philesturnus rufusater*	At Risk, Relict	Regionally Vulnerable	8	0	5 (1.1%)	0 (0%)
pōpokotea	whitehead	*Mohoua albicilla*	Not Threatened	Not Threatened	32	0	9 (2.0%)	0 (0%)
makipai	Australian magpie	*Gymnorhina tibicen*	Introduced and Naturalised	Introduced and Naturalised	184	138	49 (10.8%)	49 (10.8%)
pīwakawaka	New Zealand fantail	*Rhipidura fuliginosa*	Not Threatened	Not Threatened	14	54	13 (2.9%)	37 (8.2%)
toutouwai	North Island robin	*Petroica longipes*	At Risk, Declining	Regionally Vulnerable	1	0	1 (0.2%)	0 (0%)

Māori name	Common name	Scientific name	National NZTCS ranking	Regional NZTCS ranking	Total number of individuals counted		Number (and percentage) of survey sections in which species were observed	
					2017-2018	2022-2023	2017-2018	2022-2023
kairaka	skylark	*Alauda arvensis*	Introduced and Naturalised	Introduced and Naturalised	340	316	197 (43.5%)	171 (37.7%)
koroātito	fernbird	*Poodytes punctata*	At Risk, Declining	Regionally Vulnerable	0	4	0 (0%)	2 (0.4%)
warou	welcome swallow	*Hirundo neoxena*	Not Threatened	Not Threatened	199	332	79 (17.4%)	116 (25.6%)
tauhou	silvereye	*Zosterops lateralis*	Not Threatened	Not Threatened	40	134	39 (8.6%)	83 (18.3%)
tāringi	common starling	*Sturnus vulgaris*	Introduced and Naturalised	Introduced and Naturalised	772	877	195 (43.0%)	165 (36.4%)
manu pango	Eurasian blackbird	*Turdus merula*	Introduced and Naturalised	Introduced and Naturalised	128	117	118 (26.0%)	82 (18.1%)
manu-ka- hua-rakau	song thrush	*T. philomelos*	Introduced and Naturalised	Introduced and Naturalised	14	23	11 (2.4%)	21 (4.6%)

Māori name	Common name	Scientific name	National NZTCS ranking	Regional NZTCS ranking	Total number of individuals counted		Number (and percentage) of survey sections in which species were observed	
					2017-2018	2022-2023	2017-2018	2022-2023
	dunnock	*Prunella modularis*	Introduced and Naturalised	Introduced and Naturalised	97	98	93 (20.5%)	86 (19.0%)
tiu	house sparrow	*Passer domesticus*	Introduced and Naturalised	Introduced and Naturalised	282	587	125 (27.6%)	145 (32.0%)
pīhoihoi	New Zealand pipit	*Anthus novaeseelandiae*	At Risk, Declining	Regionally Endangered	80	110	52 (11.5%)	70 (15.5%)
pahirini	chaffinch	*Fringilla coelebs*	Introduced and Naturalised	Introduced and Naturalised	103	142	97 (21.4%)	115 (25.4%)
	greenfinch	*Chloris chloris*	Introduced and Naturalised	Introduced and Naturalised	85	94	56 (12.4%)	66 (14.6%)
	common redpoll	*Acanthis flammea*	Introduced and Naturalised	Introduced and Naturalised	8	2	6 (1.3%)	2 (0.4%)
kōurarini	goldfinch	*Carduelis carduelis*	Introduced and Naturalised	Introduced and Naturalised	99	327	58 (12.8%)	130 (28.7%)

Māori name	Common name	Scientific name	National NZTCS ranking	Regional NZTCS ranking	Total number of individuals counted		Number (and percentage) of survey sections in which species were observed	
					2017-2018	2022-2023	2017-2018	2022-2023
hurukōwhai	yellowhammer	*Emberiza citrinella*	Introduced and Naturalised	Introduced and Naturalised	147	285	119 (26.3%)	190 (41.9%)