A BASELINE SURVEY OF THE INDIGENOUS BIRD VALUES OF THE TASMAN DISTRICT COASTLINE

February 2022

Authors:
NIKKI MCARTHUR, DAVID S. MELVILLE, ROB SCHUCKARD, DAVID THOMAS, ROBIN TOY AND SANDY TOY

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Nikki McArthur[1], David S. Melville[2], Rob Schuckard[3], David Thomas[4], Robin Toy[5] and Sandy Toy[5]

[1] 17A Ida Street, Redwoodtown, Blenheim 7201
[2] 1261 Dovedale Road, RD 2, Wakefield, Nelson 7096
[3] PO Box 98, Rai Valley, 7145
[4] 64 Horrell Road, RD 4, Morrinsville 3374
[5] 78c Little Sydney Road, RD 3, Motueka 7198

10th February 2022

Citation:

This report should be cited as:

McArthur, N.; Melville, D.S.; Schuckard, R.; Thomas, D.; Toy, R. and Toy, S. 2022. A baseline survey of the indigenous bird values of the Tasman District coastline. Client report prepared for Tasman District Council, Richmond.

Cover Image: Adult Variable Oystercatcher / Tōrea Pango (*Haematopus unicolor*) with a near fully-grown chick. The chick has been marked with a white flag inscribed with the unique two-letter code "LX" as part of an ongoing Birds New Zealand investigation into the survival and movements of Variable Oystercatchers / Tōrea Pango in Tasman Bay / Te Tai-o-Aorere and Golden Bay / Mohua. Image credit: Craig Martin.

Contents

Executive Summary

Tasman District Council (TDC) is one of several agencies that have statutory responsibilities relating to the sustainable management of the natural values of the Tasman District's coastline, including its indigenous bird values. To discharge these responsibilities as efficiently and effectively as possible, TDC has been supporting efforts by Birds New Zealand and other agencies to build and maintain a detailed and up-to-date picture of the spatial distribution of indigenous bird values along the Tasman District coastline. Much of this effort has so far concentrated on carrying out regular, standardised bird counts at key shorebird roost sites including Farewell Spit and the region's estuaries, whereas comparatively little survey work has been carried out along intervening sections of coastline. To fill this information gap, TDC commissioned a survey of coastal breeding birds along the majority of the Tasman District coastline that was carried out in December 2020.

A total of 288 km of the Tasman District coastline between Port Pūponga and Richmond 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. The locations of all nests, nesting colonies and broods of chicks were also recorded.

Sixty-seven bird species and 25,200 individual birds were counted during this survey. Fifty-one of these bird species (76%) are native to New Zealand, and 26 species (39%) are ranked as either Nationally Threatened or At Risk under the New Zealand Threat Classification System. Hotspots of high native species diversity occurred along the sandy beaches and inlets of Golden Bay / Mohua and Tasman Bay / Te Tai-o-Aorere, particularly on those sections of the coast that were adjacent to large areas of intertidal flats. In contrast, lower than average numbers of native species were recorded along much of the rocky coastline of Abel Tasman National Park. In Waimea Inlet, particularly high numbers of native bird species were encountered along the Richmond foreshore, along the western and southern shorelines of Rabbit Island, at the Bell Island Shellbank, the Waimea River mouth, and along the Mapua foreshore.

A major highlight of this survey was the discovery that the Tasman District coastline supports up to 27% of the global breeding population of Variable Oystercatchers / Tōrea Pango, indicating that this coastline is of international importance for this species. Variable Oystercatchers / Tōrea Pango occur at higher densities along the Nelson-Tasman coastline than any other region of New Zealand surveyed to date. In contrast to this success story, this survey revealed that the Tasman District coastline supports relatively small and/or declining breeding populations of Spotted Shags / Kawau Tikitiki, Reef Herons / Matuku Moana, Banded Dotterels / Pohowera and White-fronted Terns / Tara.

This survey identified five coastal sites within the Tasman District that support internationally, nationally and regionally-significant concentrations of coastal birds. A shellbank at the entrance to Ruataniwha Inlet near Collingwood was found to support 50% of the regional breeding population of Red-billed Gulls / Tarāpunga and 90% of the regional breeding population of White-fronted Terns / Tara. A series of shellbanks at Rototai, near the Motupipi River mouth was found to support almost 100% of the regional coastal breeding population of Black-billed Gulls / Tarāpuka, 50% of the regional breeding population of Red-billed Gulls / Tarāpunga, 50% of the regional breeding population of Caspian Terns / Taranui and 10% of the regional breeding population of White-fronted Terns / Tara. The coastline of Abel Tasman National Park was found to support a minimum of 3% of the global population of Spotted Shags / Kawau Tikitiki, and almost the entire regional population of Reef Herons

/ Matuku Moana. The Motueka Sandspit, in addition to being a high-tide roost site for internationally important numbers of Bar-tailed Godwits / Kuaka, Variable Oystercatchers / Tōrea pango and South Island Pied Oystercatchers / Tōrea, and regionally significant numbers of Lesser Knots / Huahou and Ruddy Turnstones, also supported 50% of the regional coastal breeding population of Banded Dotterels / Pohowera. A shellbank adjacent to Bell Island in Waimea Inlet is also a regionally-significant high-tide roost for Arctic-breeding migrants and supports 50% of the regional breeding population of Caspian Terns / Taranui.

We recommend that this regional coastal bird survey be repeated at five-yearly intervals to enable TDC to maintain a complete, detailed and up-to-date picture of the indigenous bird values of the Tasman District coastline, and to contribute towards building an understanding of the long-term regional population trends of regionally threatened coastal bird species. We also recommend that the results of this survey be used along with other available information sources to re-assess and update TDC's network of coastal sites of "important natural ecosystem values" listed in Schedule 25D of the Tasman Resource Management Plan, to ensure that this network includes all of the coastal habitats that support internationally, nationally and regionally significant indigenous bird populations and communities within the Tasman District.

Keywords: Coastal bird survey, Golden Bay / Mohua, Maritime New Zealand, New Zealand Threat Classification System, oiled wildlife response, Tasman Bay / Te Tai-o-Aorere, Tasman District Council, Tasman Resource Management Plan

1. Introduction

The coastlines of the Tasman District and Nelson City support nationally and internationally significant populations of indigenous coastal bird species, many of which are ranked as either Nationally Threatened or At Risk under the New Zealand Threat Classification System and are heavily reliant on habitats within the coastal marine area for foraging, roosting and breeding either year-round, or during key parts of their annual lifecycles (Schuckard & Melville 2013; Schuckard & Melville 2019; Robertson *et al.* 2021). Many of these bird species are also highly vulnerable to human activities that result in the disturbance, degradation or destruction of these coastal habitats (Melville & Schuckard 2013; Schuckard & Melville 2013; Schuckard & Melville 2019).

Much of our current knowledge of the coastal bird values of the Tasman District and Nelson City coastlines is based on over 60 years of wader surveys that have been carried out by members of Birds New Zealand (the Ornithological Society of New Zealand). Organised wader counts in the Tasman District began at Farewell Spit in 1961, and in 1983 geographical coverage was further expanded to include several additional sites in both Golden Bay / Mohua and Tasman Bay / Te Tai-o-Aorere. These counts have been used to describe long-term trends in non-breeding populations of indigenous shorebirds present in the Tasman District, including both Arctic-breeding and internal New Zealand migrant species (Schuckard & Melville 2013). More recently, these counts, together with data from Birds New Zealand's *Atlas of bird distribution in New Zealand* Scheme, have been used to describe broad-scale patterns in the distribution of a wider set of coastal bird species along the Tasman District's coastline, to the scale of 10 x 10 km grid squares (Schuckard & Melville 2019).

Although this work has substantially improved our understanding of the bird values of the Nelson-Tasman coastline, gaps in our understanding still remain (Schuckard & Melville 2013; Schuckard & Melville 2019). In particular, although we know that the Nelson-Tasman coastline supports a nationally and internationally significant number of Banded Dotterels / Pohowera (*Charadrius bicinctus*) during the non-breeding season, our knowledge of the breeding distribution of this species along the coastline is very incomplete (Schuckard & Melville 2013). Similarly, the Nelson-Tasman coastline is known to support nationally and internationally-significant numbers of Variable Oystercatchers / Tōrea Pango (*Haematopus unicolor*), however the total population size and distribution of breeding birds in the region is currently unknown (Schuckard & Melville 2013). Both of these species are highly vulnerable to a range of threats during the breeding season, including depredation by mammalian predators and disturbance by people, vehicles and domestic animals (Melville & Schuckard 2013). Filling these knowledge gaps is therefore important for Tasman District Council to develop effective coastal policy to protect these coastal-breeding shorebirds and their habitats from disturbance or damage caused by human activities, and for working with partner agencies and local communities to actively manage the most important shorebird breeding habitats in the district. For this reason, Schuckard & Melville (2013) recommended that a systematic breeding shorebird survey be carried out along the majority of the Tasman District and Nelson City coastlines.

To implement this recommendation, Tasman District Council (TDC) and Nelson City Council (NCC) collaborated to carry out a complete and systematic survey of the indigenous bird values of the Nelson-Tasman coastline in December 2020, to create a regional-scale 'snapshot' measure of the diversity, distribution and abundance of indigenous birds inhabiting the Nelson-Tasman coastline, against which future changes in distribution and population size can be measured. A particular focus of this survey was to assess the abundance and distribution of bird species breeding along the

coastline, including Banded Dotterels / Pohowera and Variable Oystercatchers / Tōrea Pango. The results of the Nelson City coastal bird survey are summarised by McArthur *et al.* (2021a), whereas the results of the Tasman District coastal bird survey are summarised in this report. The results of this combined survey will contribute towards informing regional- and local-scale natural resource management policy and conservation management decision-making in the following areas:

1. **Updating the identification and spatial mapping of sites with "significant conservation values" along the Nelson-Tasman coastline**

   Regional Councils 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 and unitary authorities 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.

   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 both the Tasman Resource Management Plan (TRMP) and the Nelson Resource Management Plan (NRMP) to "identify ecosystems and habitats with significant biodiversity values". To meet this requirement, Policy 9.6 of the Tasman Regional Policy Statement (TDC 2001) directs TDC to "preserve the natural character of the coastal environment by protecting:

   - Natural features and landscapes, such as headlands and cliffs, coastal plains, estuaries, tidal flats, dunes and sand beaches
   - Habitats such as estuaries and wetlands
   - Ecosystems, especially those including rare or endangered species or communities, or migratory species"

   To achieve this, Policy 9.6 states that TDC will "investigate and collect information on habitats, features, sites, landscapes or seascapes, ecosystems and natural processes that support the natural character of the coastal environment of the District [and will] assess the extent, location, significance and risks to such areas, features, ecosystems or values and the options available for protection or enhancement."

   To contribute towards the implementation of this policy, Schedule 25D of the TRMP includes a list of 22 sites within the Tasman District coastal marine area that possess "nationally or internationally important natural ecosystem values" that had been identified by the Department of Conservation in 1993 (Davidson *et al.* 1993; TDC 2008) Given the changes that have likely occurred to coastal habitats and to the distribution and abundance of coastal bird species along the Nelson-Tasman coastline since 1993, the spatially-explicit dataset created by this survey will create a timely opportunity to review and update the indigenous bird values of these existing 22 sites, and to identify additional sites along the Tasman District coastline that now meet the relevant selection criteria.

2. Improving regional Maritime New Zealand Oiled Wildlife Response preparedness along the Nelson-Tasman coastline

Under Sections 283 and 284 of the Maritime Transport Act (1994), Maritime New Zealand (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 signed Memoranda of Understanding with local government agencies to build national- and regional-scale capability and infrastructure to respond to marine oil spill incidents. Under their MOUs with MNZ, both TDC and NCC have 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).

By creating an updated and much more detailed picture of the spatial distribution of coastal birds and marine mammals along the Nelson-Tasman coastline, the results of this survey will greatly improve TDC, NCC and MNZ's capability to predict the location and severity of oiled wildlife incidents associated with marine oil spills, and as a result these agencies will be able to mount a much more rapid and targeted response to such incidents. This baseline measure of the distribution and abundance of coastal bird species will also provide a comprehensive benchmark against which any adverse impacts of future marine oil spills, and the effectiveness of efforts to control, contain or manage the impacts of these spills, can be quantified. This project deliverable aligns with one of the four principles of MNZ's Marine Oil Spill Readiness and Response Strategy, namely to "use information, research and expertise as key enablers", and in turn aligns with Objective 2.4 of the Strategy, namely to "undertake study and research and gather data to improve the environmental and technical knowledge needed to maintain and enhance New Zealand's readiness and response system" (MNZ 2018).

3. Informing regional threat classification rankings

In recent years, several regional councils (including Waikato Regional Council, Hawke's Bay Regional Council and Greater Wellington Regional Council) have been working with the Department of Conservation (DOC) to develop a system for assigning regional threat classification rankings to species present within individual regions, using a set of New Zealand Threat Classification System criteria that have been modified to be applicable at a regional, rather than national, scale (Townsend *et al.* 2008; Crisp 2020; HBRC/DOC, unpublished data). These regional threat rankings are increasingly being used by regional councils to inform regional conservation management priorities, as they provide a more accurate representation of the regional threat status of bird species which may be faring better or worse in a particular region than they are at a national scale. To assign appropriate regional threat rankings to the bird species present in the Tasman District and in Nelson City, accurate estimates of both population size and trend are required for each species. One further outcome of this coastal bird survey therefore is that it will enable both TDC and NCC to update regional breeding population size estimates for several bird species that are either entirely, or partly, restricted to coastal habitats. These population estimates will in turn allow more accurate and evidence-based regional threat rankings to be assigned to these species in the future, leading to

improvements in the sustainable management of these species and their habitats in the Tasman District and in Nelson City.

4. Implementing the draft National Policy Statement for Indigenous Biodiversity

The Ministry for the Environment (MFE) has prepared a Proposed National Policy Statement for Indigenous Biodiversity (PNPSIB), which sets out objectives and policies for local government agencies to manage natural and physical resources in order to maintain indigenous biodiversity as required by the Resource Management Act (1991). Although the PNPSIB does not strictly apply to indigenous biodiversity found in the coastal marine area, Policy 13 of the NPS does require local government agencies to "identify the possible presence of, and manage, highly-mobile fauna"[1] (MFE 2019). More specifically, the PNPSIB requires each regional council and unitary authority to work with local territorial authorities "to survey and record areas outside Significant Natural Areas where highly mobile fauna have been, or are likely to be, sometimes present" and to "include objectives, policies or methods in their policy statements and plans for managing the adverse effects of subdivision, use and development in highly mobile fauna areas, as necessary to maintain viable populations of highly mobile fauna across their natural range" (MFE 2019).

Many of the indigenous bird species present along the Nelson-Tasman coastline meet the PNPSIB definition of being "mobile fauna"[1]. These include endemic shorebird species such as the Banded Dotterel / Pohowera and South Island Pied Oystercatcher / Tōrea (*Haematopus finschi*), which migrate annually between inland breeding grounds in the spring and summer months to coastal non-breeding sites in the autumn and winter (Heather & Robertson 2015). By mapping the distribution and abundance of these mobile species along the Nelson-Tasman coastline during summer, this survey will fill substantial gaps in TDC and NCC's knowledge of the regional distribution of these mobile bird species during the summer months in the Tasman District and in Nelson City, therefore partially implementing Policy 13 of the PNPSIB.

5. Implementing the Waimea Inlet Management Strategy and Action Plan

Tasman District Council, Nelson City Council, the Department of Conservation and the Nelson-Marlborough Fish and Game Council are co-signatories to the Waimea Inlet Management Strategy, which seeks to sustainably manage the natural and ecological values of the South Island's largest enclosed estuary and an internationally-important habitat for migratory shorebirds (Anonymous 2010; Davidson 1993; Melville & Schuckard 2013). To implement this strategy, a Waimea Inlet Action Plan has been prepared, which sets out an agreed-upon list of objectives, outcomes, actions and targets to be worked upon by members of the Waimea Inlet Coordination Group, including:

- Action 5.1.2: Actively manage all threatened species in the Inlet and its surrounds.
- Action 5.2.1: Manage human disturbance of wildlife.

[1] The PNPSIB defines highly mobile fauna as species that a) are highly mobile; b) where some individuals move between different environments during their life cycle for reasons such as feeding, mating, nesting, moulting or in response to climatic conditions; and c) for the purposes of this National Policy Statement, include only threatened or at-risk species (MfE 2009; p12).

- Action 5.2.2: Reduce the impacts of cats and dogs around the estuary as populations pressures increase.
- Action 5.2.3: Give formal protection to, and manage human activities in, important wildlife areas
- Action 5.2.4: Follow recommended actions from *Effects of selected activities on shorebirds in Tasman District - Management issues and options for site of International Importance* David S. Melville and Rob Schuckard (November 2013)
- Action 5.2.5: Continue monitoring of populations and site conditions (roosting, nesting, feeding) as part of State of the Environment monitoring to determine the effectiveness of coastal management actions and RMA compliance (Anonymous 2019).

The results of this Tasman District coastal bird survey will assist with the implementation of the Waimea Inlet Action Plan by creating a 'snapshot' of the summer distribution and abundance of shorebirds along the entire Waimea Inlet shoreline to complement the longer timeseries of shorebird counts compiled by Birds New Zealand and reported in Schuckard & Melville (2013). Taken together, these information sources can be used to inform the location and prioritisation of management actions and will also provide a comprehensive baseline measure of the summer shorebird values of Waimea Inlet, against which the future successes of the Waimea Inlet Management Strategy and Waimea Inlet Action Plan can be measured.

This report provides a summary of the results of the first comprehensive survey of the indigenous bird values of the Tasman District coastline and provides a number of recommendations for how the information gained can be used to update the mapping of areas with "nationally or internationally important natural ecosystem values", to improve regional oiled wildlife response preparedness, to assess regional threat rankings and to contribute towards the implementation of the PNPSIB and the Waimea Inlet Management Strategy and Action Plan. This report also includes recommendations for further survey and monitoring work required to ensure that TDC continues to maintain and improve its knowledge of the spatial distribution, population trends and threats facing the Tasman District's coastal bird fauna.

2. Methods

2.1 Survey area

A bird survey was carried out along a total of 288 km of the Tasman District coastline between the 9th and 17th December 2020, between Port Pūponga and Richmond. The majority of the mainland coastline was surveyed on foot, however most of the Abel Tasman National Park coastline was surveyed by motorised boat and the majority of Waimea Inlet and portions of the Kaiteriteri coastline were surveyed by kayak (Figure 2.1).

Farewell Spit and the west coast of the Tasman District from the base of Farewell Spit to Kahurangi Point were both excluded from the survey, due to logistical and funding constraints. In the case of Farewell Spit, both the summer and winter abundance and distribution of non-breeding shorebirds is comparatively well known as a result of over 60 years of Birds New Zealand wader surveys, however the abundance of a number of breeding species, including gulls, terns and Tākapu / Australasian gannets (*Morus serrator*) is not regularly monitored (Schuckard *et al.* 2020; David S. Melville personal communication).

2.2 Field methods

This survey was carried out during the shorebird breeding season, at a time of year when a number of coastal-breeding shorebird species 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 these species were relatively sedentary therefore minimised 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 coastline on foot, between one and three observers walked along the foreshore, usually near the high tide mark, recording the identity and numbers of all birds that were seen or heard, including any birds encountered on the foreshore as well as any birds detected either offshore or further inland. Any birds seen flying overhead were also counted, provided they were flying in a direction perpendicular or opposite to the direction of travel of the observer(s). Birds flying in the same direction that the observer(s) were travelling in were not counted, to minimise the risk of double-counting birds. Special care was taken to systematically scan all areas of dry, un-vegetated gravels or sand on the foreshore, and any muddy backwaters, seepages, ponds, lagoons, rock pools, rock platforms, rocky islands and rock outcrops encountered along the coast to minimise the risk of missing key shorebird taxa such as dotterels, oystercatchers, gulls, terns and herons. Separate counts were recorded for each 1 km section of coastline traversed, so that spatial patterns in the distribution and relative abundance of shorebirds could be mapped to a 1 km spatial resolution. In addition to counting all birds that were detected, the locations of any active nests or nesting colonies, and any dependent chicks or recently fledged young encountered along the coastline were also recorded using handheld GPS devices.

When surveying the coastline by boat, several observers travelled along the coast in a small boat at a speed of approximately 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 traversed the coastline at a distance of 50 m - 100 m offshore, however this distance was occasionally extended to up to 200 m, in order to avoid navigational hazards such as submerged rocks.

When surveying the coastline by kayak, 1-2 observers traversed the coastline at a distance of 10 m offshore, although this distance was occasionally extended to avoid shallow water or submerged obstacles. Whenever birds were observed or suspected to be breeding, the observers would land on the foreshore to confirm breeding activity, count the number of nests or chicks present and to GPS the locations of nests or chicks.

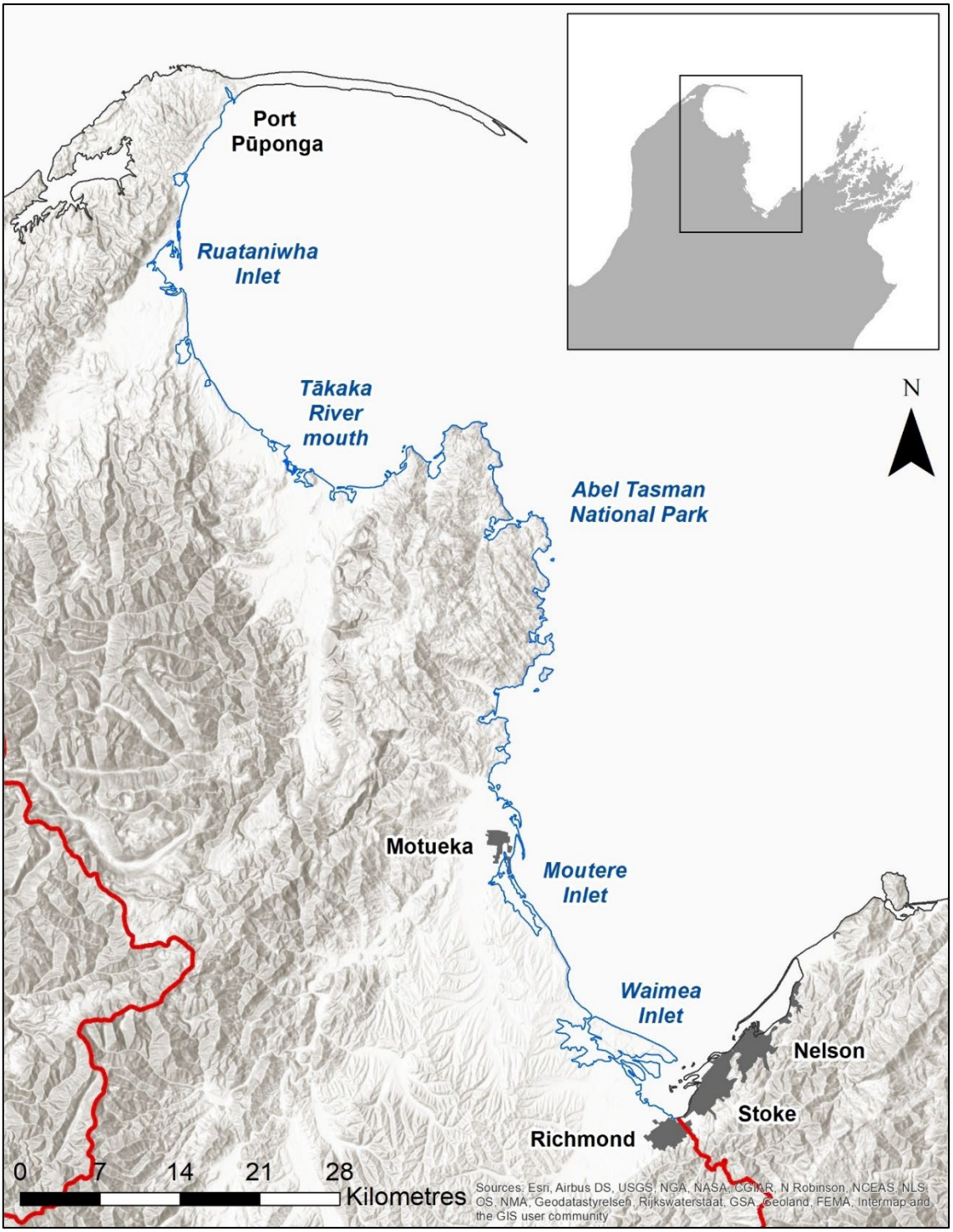

Figure 2.1: Extent of the Tasman District coastline surveyed in December 2020 (blue line). The Tasman District boundary is shown in red.

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 ArcMap version 10.8.2, 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 scanned copies of the field datasheets, have been provided to Tasman District 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 Spatial patterns in species diversity

Sixty-seven bird species and 25,200 individual birds were recorded during this survey of the Tasman District coastline and a full list of these species can be found in Appendix One. 51 of these species (76%) are native to New Zealand and the remaining 16 species (24%) are introduced and naturalised species. This level of indigenous dominance is similar to that recorded along other parts of the central New Zealand coastline. For example, 70% of the fifty bird species encountered along 97 km of the Nelson City coastline during December 2020 were native species (McArthur *et al.* 2021a). Similarly, 72% of the 79 bird species recorded along 321 km of the Hawke's Bay coastline surveyed in January 2021 were native species (McArthur *et al.* 2021b) and 74% of the 69 bird species recorded along 460 km of the Wellington region coastline surveyed in 2017-2018 were native species (McArthur *et al.* 2019).

Twenty-six of the bird species detected along the Tasman District coastline (39%) are ranked as either Nationally Threatened or At Risk under the New Zealand Threat Classification System, including one species ranked as Nationally Critical, two species ranked as Nationally Endangered, three species ranked as Nationally Vulnerable, one species ranked as Nationally Increasing, eleven species ranked as At Risk, Declining, three species ranked as At Risk, Relict, two species ranked as At Risk, Recovering and three species ranked as At Risk, Naturally Uncommon (Robertson *et al.* 2021; Table 3.1).

The proportion of bird species detected along the Tasman District coastline that are ranked as Nationally Threatened or At Risk is similar to that recorded along other parts of the central New Zealand coastline. For example, 32% of the bird species recorded along the Nelson City coastline during December 2020 are ranked as Nationally Threatened or At Risk under the New Zealand Threat Classification System (McArthur *et al.* 2021a). Similarly, 35% of the bird species detected along the Hawke's Bay coastline in January 2021 and 36% of the bird species detected along the Wellington coastline in 2017-2018 and are ranked as Nationally Threatened or At Risk (McArthur *et al.* 2019; McArthur *et al.* 2021b).

A mean of 7.6 native bird species was recorded per survey section along the Tasman District coastline, however local species diversity varied considerably between individual survey sections. (Figures 3.1, 3.2, 3.3 and 3.4). Higher than average numbers of native bird species were typically recorded along the sandy beaches and inlets of Golden Bay / Mohua between Port Pūponga and Wainui Bay, whereas lower than average numbers of native species were recorded along much of the rocky coastline of Abel Tasman National Park (Figures 3.1 and 3.2). This spatial pattern was rather similar in Tasman Bay / Te Tai-o-Aorere, with higher than average numbers of native bird species encountered along sections of coastline with wide sandy beaches and/or large areas of intertidal habitat and lower numbers of native birds along sections of coastline with comparatively little suitable shorebird habitat above the high tide mark and much smaller areas of intertidal habitat (Figure 3.3). In Waimea Inlet, the South Island's largest enclosed estuary, high numbers of native bird species were encountered along the Richmond foreshore, along the western and southern shorelines of Rabbit Island, at the Bell Island Shellbank and Waimea River mouth, and along the Mapua foreshore (Figure 3.4).

Table 3.1: List of bird species detected during this 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
Nationally Critical	Grey Duck / Pārera
National Endangered	Reef Heron / Matuku Moana, Black-fronted Tern / Tarapirohe
Nationally Vulnerable	Spotted Shag / Kawau Tikitiki, Caspian Tern / Taranui, Kākā
Nationally Increasing	New Zealand Falcon / Kārearea
At Risk, Declining	Little Penguin / Kororā, Banded Rail / Moho Pererū, Red Knot / Huahou, Bar-tailed Godwit / Kuaka, SI Pied Oystercatcher / Tōrea, Banded Dotterel / Pohowera, Red-billed Gull / Tarāpunga, Black-billed Gull / Tarāpuka, White-fronted Tern / Tara, South Island Robin / Kakariwai, Fernbird / Mātātā
At Risk, Relict	Fluttering Shearwater / Pakahā, Little Shag / Kawau Paka, Black Shag / Kawau
At Risk, Recovering	Pied Shag / Kāruhiruhi, Variable Oystercatcher / Tōrea Pango
At Risk, Naturally Uncommon	Little Black Shag / Kawau Tūi, Royal Spoonbill / Kotuku Ngutupapa, Black-fronted Dotterel

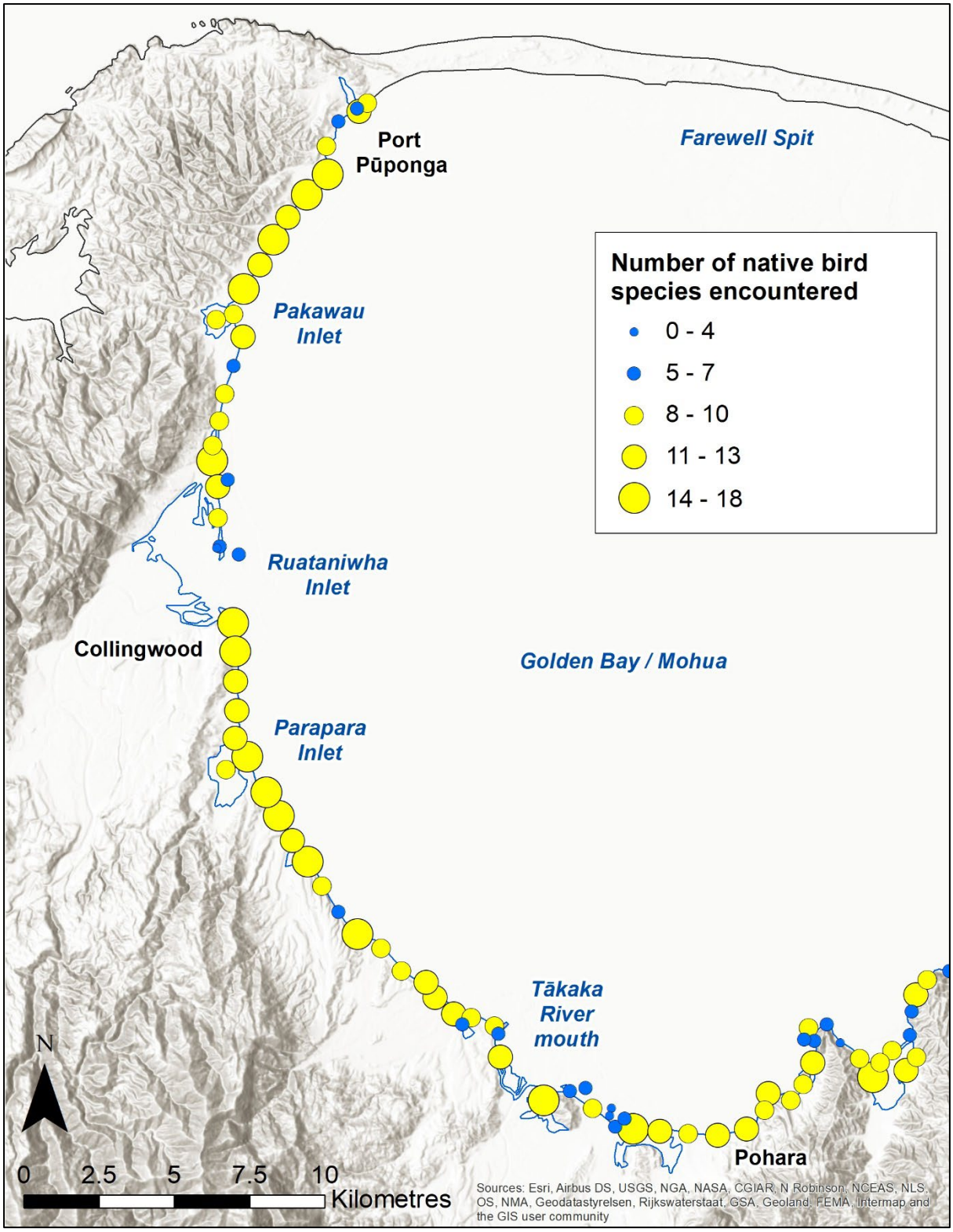

Figure 3.1: Spatial patterns in the species richness of indigenous bird species along the Golden Bay / Mohua coastline. Blue dots represent coastal survey sections with below average numbers of indigenous bird species and yellow dots represent survey sections with above average numbers of indigenous bird species.

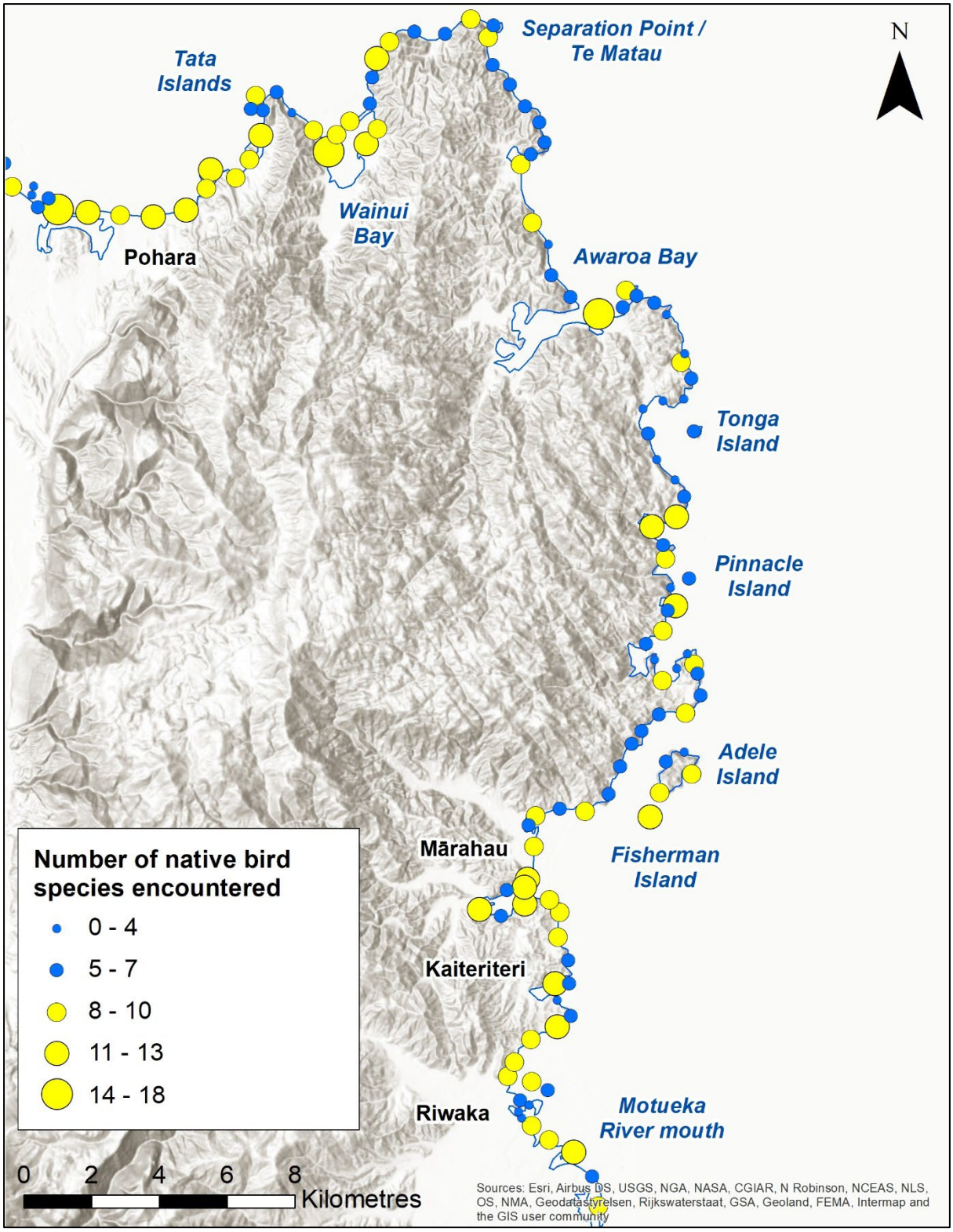

Figure 3.2: Spatial patterns in the species richness of indigenous bird species along the Abel Tasman National Park - Kaiteriteri coastline. Blue dots represent coastal survey sections with below average numbers of indigenous bird species and yellow dots represent survey sections with above average numbers of indigenous bird species.

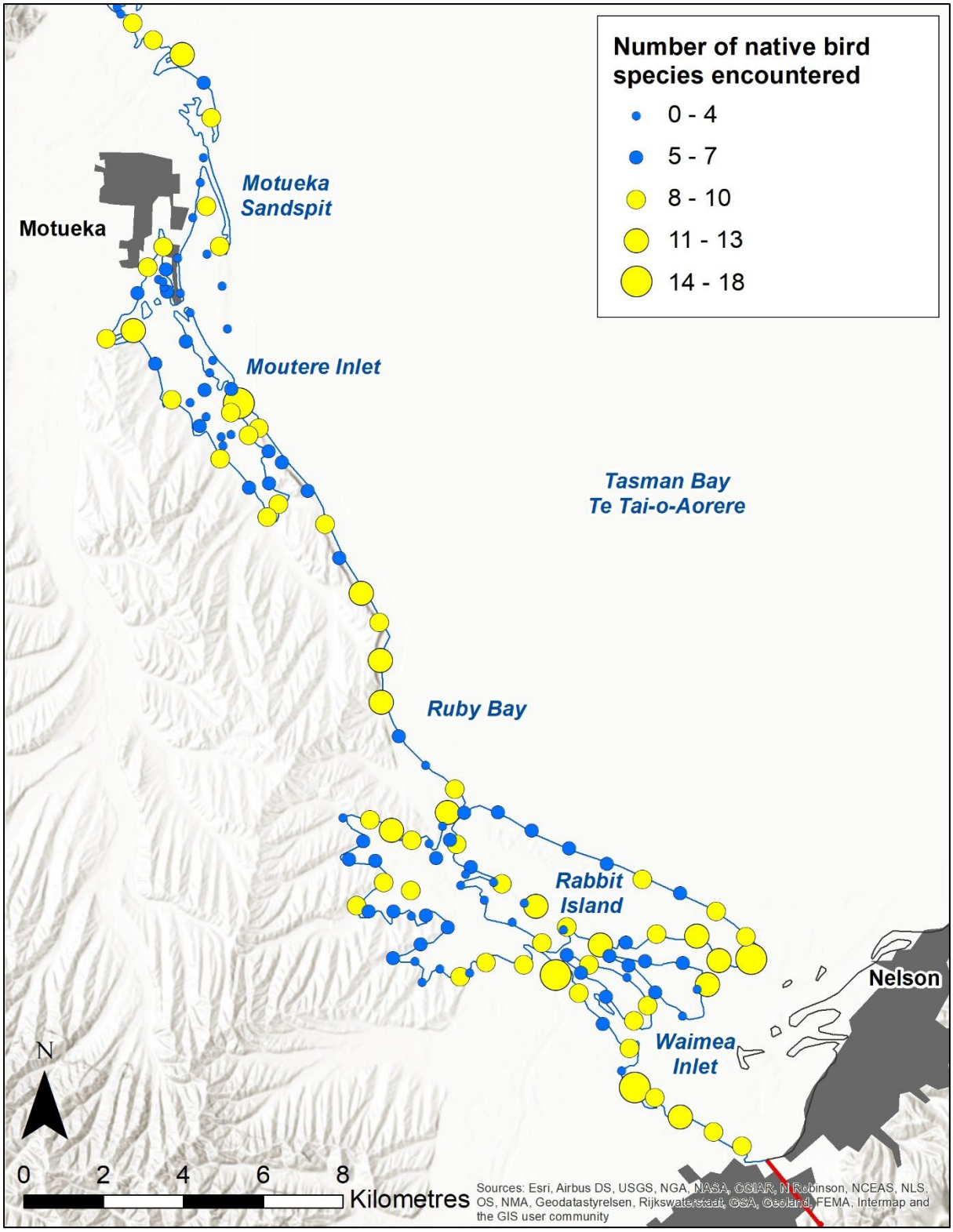

Figure 3.3: Spatial patterns in the species richness of indigenous bird species along the Tasman Bay / Te Tai-o-Aorere coastline. Blue dots represent coastal survey sections with below average numbers of indigenous bird species and yellow dots represent survey sections with above average numbers of indigenous bird species.

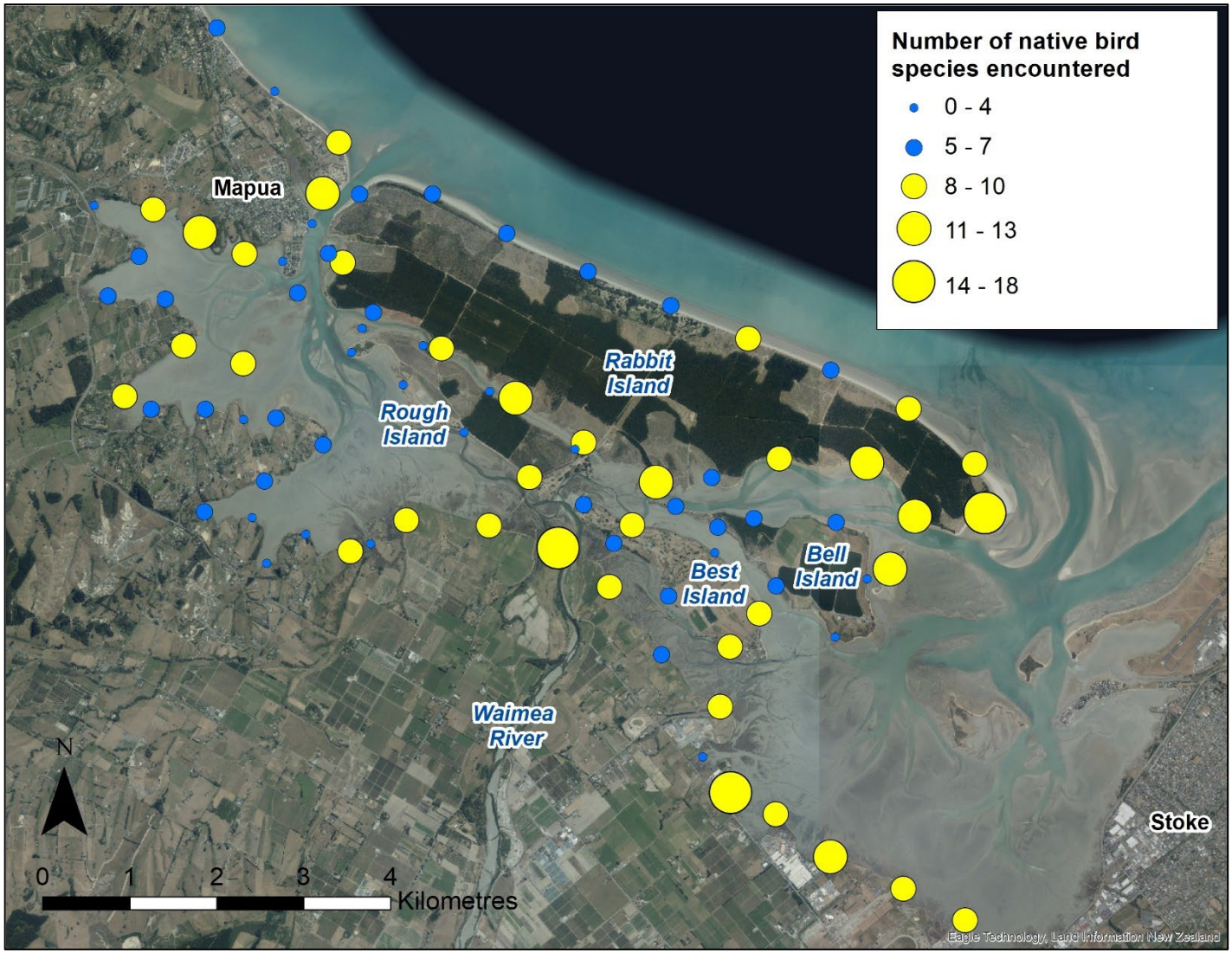

Figure 3.4: Spatial patterns in the species richness of indigenous bird species in Waimea Inlet. Blue dots represent coastal survey sections with below average numbers of indigenous bird species and yellow dots represent survey sections with above average numbers of indigenous bird species.

3.2 Spatial patterns in species abundance

In the following sections of the report, we have mapped spatial patterns in the abundance of 18 of the 51 native bird species that were detected along the Tasman District coastline. These species have been chosen because they are entirely, or largely, restricted to coastal habitats in the Tasman District and the majority of these species are also ranked as either Nationally Threatened or At Risk under the New Zealand Threat Classification System (Robertson *et al.* 2021). A full list of all the bird species recorded during this survey can be found in Appendix One.

3.2.1 Little Shag / Kawau Paka (*Phalacrocorax melanoleucos*)

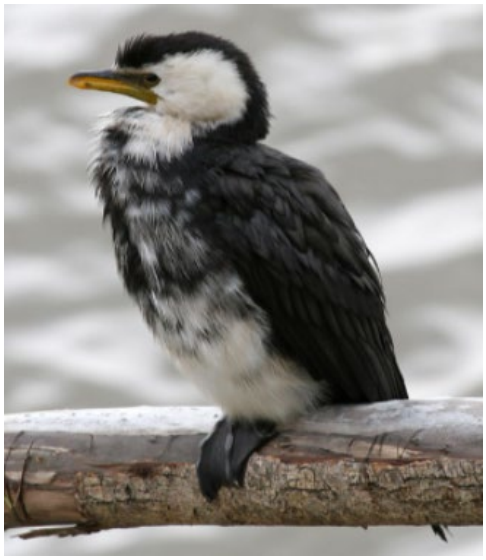

Image courtesy of Ormond Torr/NZ Birds Online

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

One hundred and nineteen Little Shags / Kawau Paka were counted during this survey, occupying 65 (20.6%) of the 315 sections of coastline surveyed (Figure 3.5). Little Shags / Kawau Paka were sparsely distributed along the majority of the Tasman District coastline with local concentrations of bird encountered near Port Pūponga, at Taupō Point, the Motueka River mouth and in Waimea Inlet. Two of these local concentrations (at Taupō Point and in Waimea Inlet) were associated with small breeding colonies, the latter of the two being situated on Rough Island (Figure 3.5).

Little Shags / Kawau Paka are known to occupy a range of habitats within the Tasman District, including the coastline, rivers, freshwater wetlands, lakes and ponds (Heather & Robertson 2015; eBird 2022). Given the small size of the two breeding colonies located along the Tasman District coastline during this survey (the Taupō Point colony contained four occupied nests whereas the Rough Island colony contained 'several' unoccupied nests), the majority of the adult birds recorded along the Tasman District coastline during this survey must breed at colonies situated either further inland in the Tasman District or in other parts of New Zealand.

Due to a scarcity of data on the presence and size of inland Little Shag / Kawau Paka breeding colonies within the Tasman District, it is difficult to assign a regional threat ranking to this species with a high degree of confidence. However, based on the fact that only two comparatively small coastal breeding colonies were detected during this survey and the fact that no large inland breeding colonies have recently been reported in the Tasman District (eBird 2022), it's probable that the current breeding population in the Tasman District does not exceed 250 mature individuals. Applying a population estimate of <250 Little Shags / Kawau Paka to the regional New Zealand Threat Classification System, we recommend that this species should be ranked as Regionally Critical in the Tasman District based on criterion A(1): <250 mature individuals (Townsend *et al.* 2008; Crisp 2020). We recommend that this ranking be given the qualifiers CI (Climate Impacts), DPS (Data Poor Size), DPT (Data Poor Trend) according to the qualifier definitions provided by Rolfe *et al.* (2021).

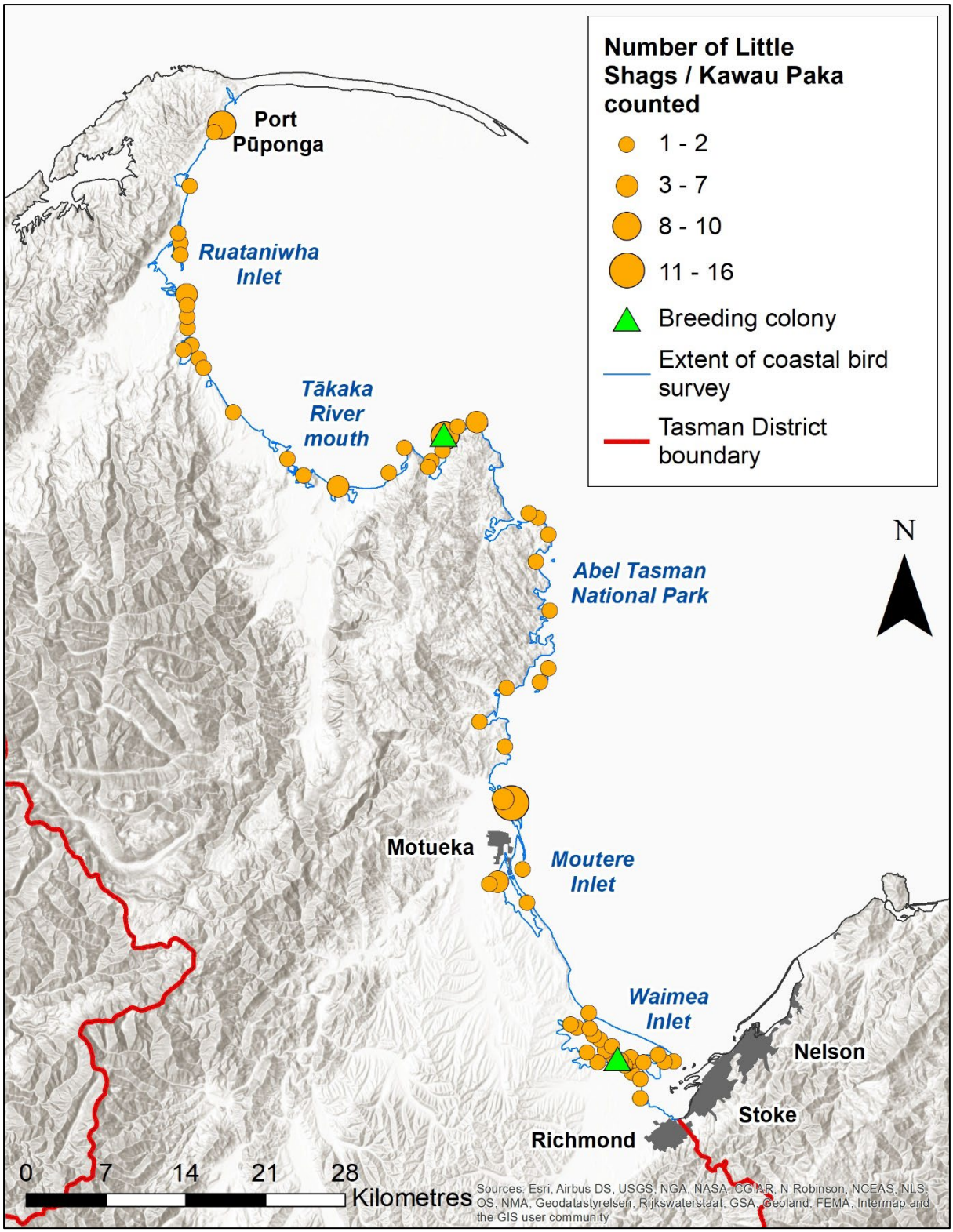

Figure 3.5: Distribution and relative abundance of Little Shags / Kawau Paka along the Tasman District coastline.

3.2.2 Black Shag / Kawau (*Phalacrocorax carbo*)

Image courtesy of Ormond Torr/NZ Birds Online

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

Thirty-seven Black Shags / Kawau were counted during this survey, occupying 24 (7.6%) of the 315 sections of coastline surveyed (Figure 3.6). Black Shags / Kawau had a clustered distribution along the Tasman District coastline, with the majority of birds encountered roosting or foraging in estuaries and inlets including the Ruataniwha and Parapara Inlets, the Takaka and Motupipi Estuaries, the Riuwaka River mouth and the Moutere and Waimea Inlets (Figure 3.6). No Black Shag / Kawau breeding colonies were observed along the Tasman District coastline.

With a mean of just 0.13 birds counted per km of coastline during this survey, Black Shags / Kawau were comparatively scarce along the Tasman District coastline compared to other stretches of coastline in central New Zealand. For example, a total of 148 Black Shags / Kawau was counted along 460 km of coastline in the Wellington region in November-December 2017-2018 (0.32 birds/km) (McArthur *et al.* 2019) and 500 birds were counted along 321 km of coastline in the Hawke's Bay region in January 2021 (1.56 birds/km) (McArthur *et al.* 2021b). Black Shags / Kawau were even more scarce along the Nelson City coastline however, with only a single bird encountered along 97 km of coastline (0.01 birds/km) in December 2020 (McArthur *et al.* 2021a). In both the Wellington and Hawke's Bay regions, the distribution of Black Shags / Kawau and Pied Shags / Kāruhiruhi (*Phalacrocorax varius*) are almost completely mutually exclusive, suggesting that Pied Shags / Kāruhiruhi may displace Black Shags / Kawau from coastal habitats as a result of some form of competitive exclusion between these two species (McArthur *et al.* 2019; McArthur *et al.* 2021b). Pied Shags / Kāruhiruhi are comparatively common and widespread along the Tasman District coastline (Figure 3.7), which may therefore explain the relative scarcity of Black Shags / Kawau.

In the Tasman District, Black Shags / Kawau are known to occupy a range of habitats including the coastline, rivers, freshwater wetlands, lakes and ponds (eBird 2022). Given this widespread and sparse distribution, it's difficult to generate a population estimate for this species for the Tasman District, however Black Shag / Kawau observations submitted to the New Zealand eBird database indicate that the Tasman District population is likely to be well below 250 mature individuals. Applying a population estimate of <250 adult birds in the Tasman District to the regional New Zealand Threat Classification System criteria and assuming a stable population, we recommend that this species should be ranked as Regionally Critical based on criterion A(1): <250 mature individuals (Townsend *et al.* 2008; Crisp 2020). We also recommend that this ranking be given the qualifiers DPS (Data Poor Size), DPT (Data Poor Trend), Sp (Biologically Sparse) and SO (Secure Overseas) according to the qualifier definitions provided by Rolfe *et al.* (2021).

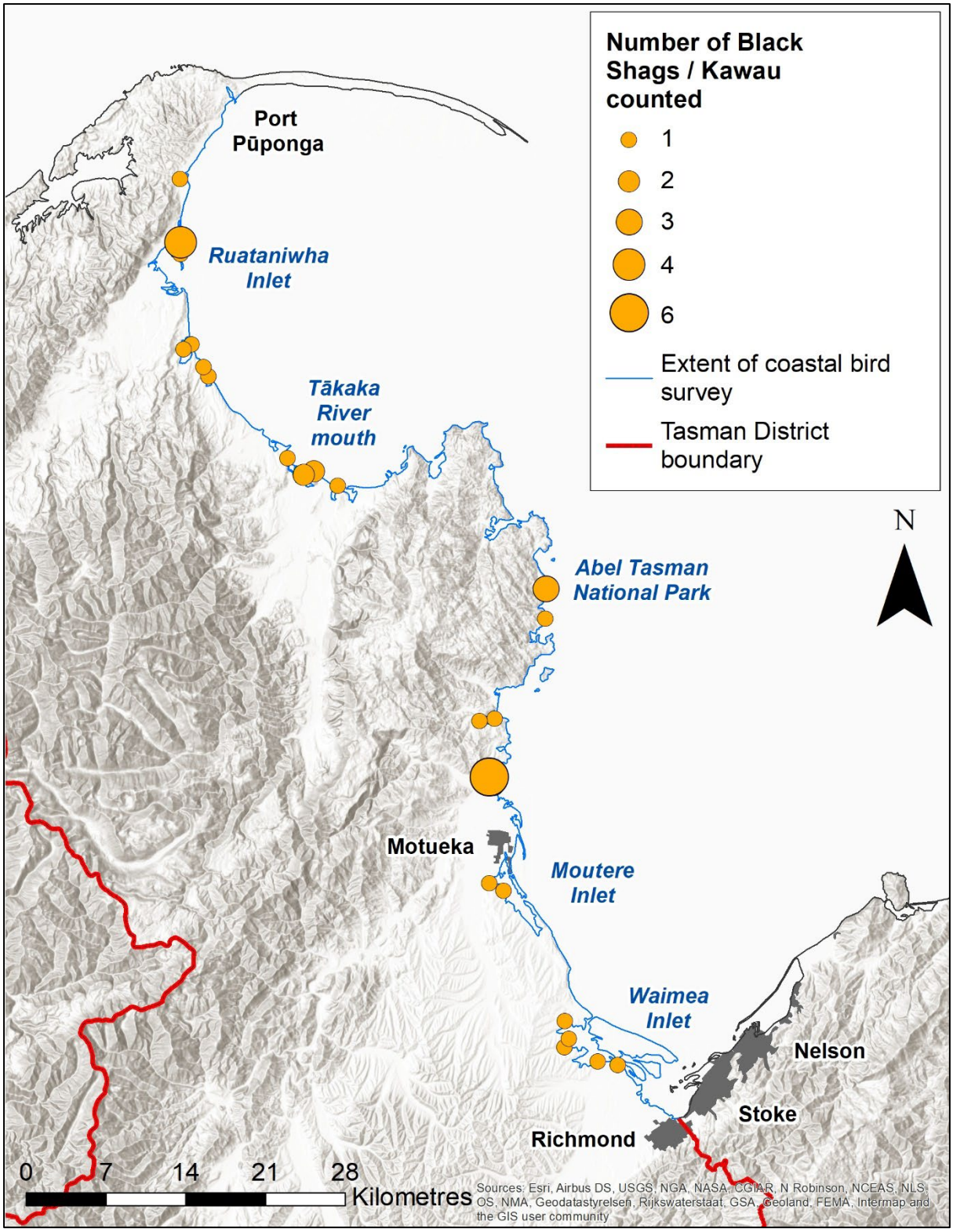

Figure 3.6: Distribution and relative abundance of Black Shags / Kawau along the Tasman District coastline.

3.2.3 Pied Shag / Kāruhiruhi (*Phalacrocorax varius*)

Image courtesy of Peter Reese/NZ Birds Online

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

Three hundred and sixty-two Pied Shags / Kāruhiruhi were counted during this survey, occupying 98 (31.1%) of the 315 sections of coastline surveyed (Figure 3.7). Pied Shags / Kāruhiruhi were fairly uniformly distributed along the Tasman District coastline but were particularly common along the Abel Tasman National Park coastline and in Waimea Inlet. Six breeding colonies were located during this survey, four of which were located along the Abel Tasman National Park coastline, one was located at Tokongawha Point (near Mārahau), and one was located at Moutere Bluff (Figure 3.7). Among these six breeding colonies, only a small proportion of the nests present appeared to be active, with a total of 18 occupied nests counted.

Pied Shags / Kāruhiruhi have a disjunct distribution in New Zealand, with a southern breeding population in the southern South Island and Stewart Island, a central breeding population in the northern South Island and Wellington, and a northern breeding population in Northland, Auckland, Bay of Plenty, East Cape and northern Hawke's Bay (Robertson *et al.* 2007; Bell 2013). In recent years, the northern breeding population has been extending southwards into Hawke's Bay (McArthur *et al.* 2021b) and the central breeding population has expanded north-eastwards up the Kāpiti Coast and into the Wairarapa (McArthur *et al.* 2019). In both Hawke's Bay and Wellington, Pied Shags / Kāruhiruhi and Black Shags / Kawau have almost mutually-exclusive coastal distributions, suggesting that Pied Shags / Kāruhiruhi may be displacing Black Shags / Kawau from coastal habitats in these regions as a result of some form of competitive exclusion between these two species (McArthur *et al.* 2019; McArthur *et al.* 2021b). Along the Tasman District coastline, Pied Shags / Kāruhiruhi are relatively common and widespread (Figure 3.7), whereas Black Shags / Kawau are very scarce (Figure 3.6), suggesting that the former species may be displacing the latter from coastal habitats in the Tasman District as well.

Assuming that the majority of the Pied Shags / Kāruhiruhi counted during this survey are breeding along the Tasman District coastline, we recommend that this species should be ranked as Regionally Vulnerable in the Tasman District based on criterion A (1/1) 250–1000 mature individuals, predicted increase > 10% (Townsend *et al.* 2008; Crisp 2020). We also recommend this ranking be given the qualifier CI (Climate Impacts) according to the qualifier definitions provided by Rolfe *et al.* (2021).

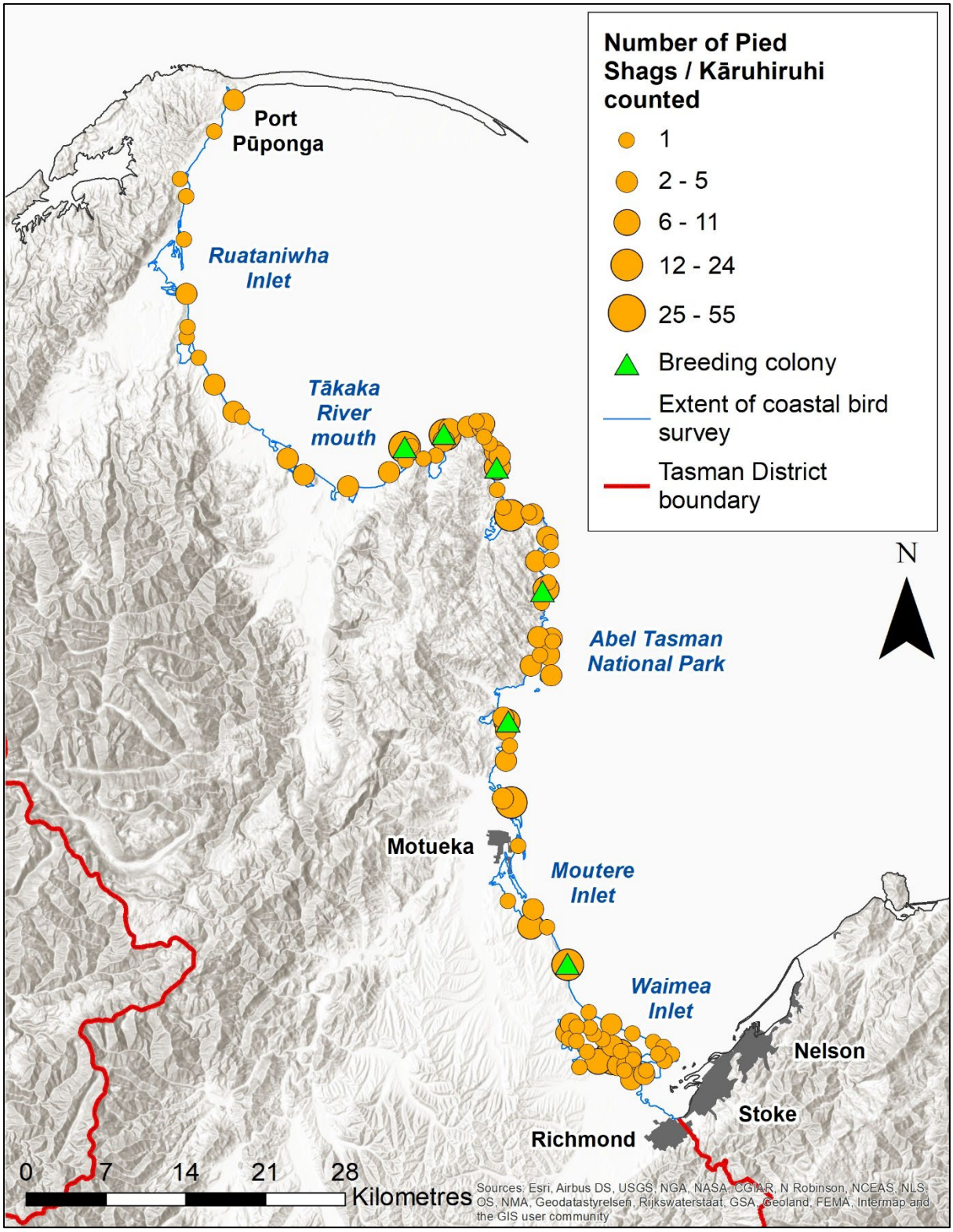

Figure 3.7: Distribution and relative abundance of Pied Shags / Kāruhiruhi along the Tasman District coastline.

3.2.4 Little Black Shag / Kawau Tūī (*Phalacrocorax sulcirostris*)

Image courtesy of Glenn Pure/NZ Birds Online

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

Twenty-four Little Black Shags / Kawau Tūī were counted during this survey, occupying six (1.9%) of the 315 sections of coastline surveyed (Figure 3.8). Little Black Shags / Kawau Tūī were only observed in Tasman Bay / Te Tai-o-Aorere, between Abel Tasman National Park and the Waimea Inlet, with local concentrations of birds at Tokongawha Point (near Mārahau), the Motueka River mouth and at Rough Island in Waimea Inlet. A small breeding colony containing two active Little Black Shag / Kawau Tūī nests were located on Tokongawha Point (Figure 3.8). No Little Black Shags / Kawau Tui were observed in Golden Bay / Mohua during this survey; however, they have been regularly recorded in this area in recent years (eBird 2022).

Little Black Shags / Kawau Tūī appear to be fairly scarce along the central New Zealand coastline at the present time. The mean of 0.08 birds/km recorded during this survey is similar to the low densities found other stretches of coastline in the lower North Island and upper South Island. For example, a total of 10 Little Black Shags / Kawau Tūī were counted along 460 km of coastline (a mean of 0.02 birds/km) in the greater Wellington region in 2017-2018 (McArthur *et al.* 2019) and 30 Little Black Shags / Kawau Tūī were counted along 321 km of coastline (a mean of 0.09 birds/km) in the Hawke's Bay region in January 2021 (McArthur *et al.* 2021b). Similarly, only a single Little Black Shag / Kawau Tūī was recorded along 97 km of the Nelson City coastline (a mean of 0.01 birds/km) in December 2020 (McArthur *et al.* 2021a).

In the Tasman District, Little Black Shags / Kawau Tūī are known to occupy a range of habitats including the coastline, rivers, freshwater wetlands, lakes and ponds (eBird 2022). Given this widespread and sparse distribution, it's difficult to generate a population estimate for this species for the Tasman District, however Little Black Shag / Kawau Tūī observations submitted to the New Zealand eBird database indicate that the Tasman District population is likely to be well below 250 mature individuals. Applying a population estimate of <250 adult birds in the Tasman District to the regional New Zealand Threat Classification System criteria, we recommend that this species should be ranked as Regionally Critical based on criterion A(1): <250 mature individuals (Townsend *et al.* 2008; Crisp 2020). We also recommend that this ranking be given the qualifiers DPS (Data Poor Size), DPT (Data Poor Trend), Sp (Biologically Sparse) and SO (Secure Overseas) according to the qualifier definitions provided by Rolfe *et al.* (2021).

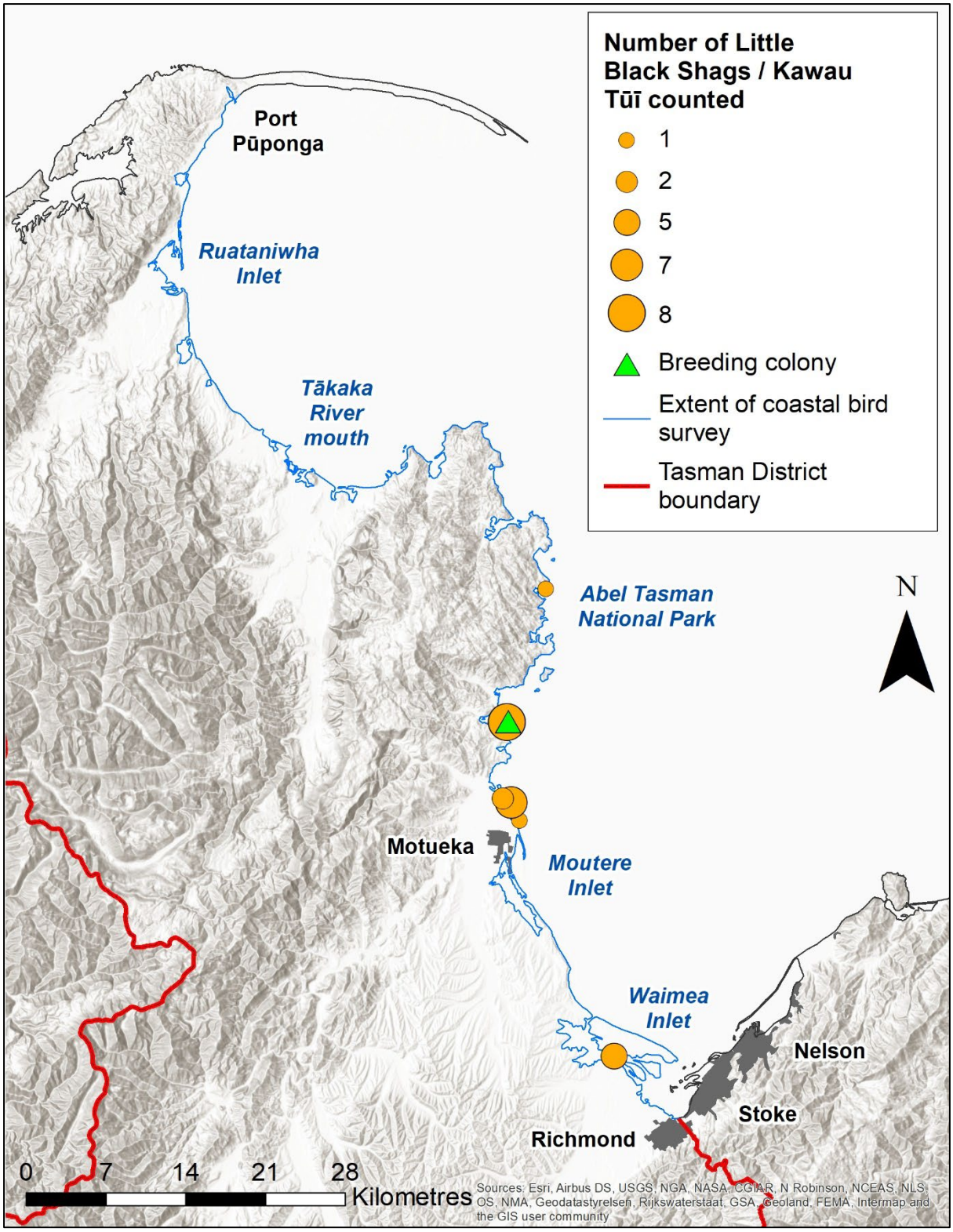

Figure 3.8: Distribution and relative abundance of Little Black Shags / Kawau Tūī along the Tasman District coastline.

3.2.5 Spotted Shag / Kawau Tikitiki (*Stictocarbo punctatus*)

Image courtesy of Ormond Torr/NZ Birds Online

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

Eight hundred and sixty Spotted Shags / Kawau Tikitiki were counted during this survey, occupying 56 (17.8%) of the 315 sections of coastline surveyed (Figure 3.9). Spotted Shags / Kawau Tikitiki were the most common of the five species of shag that were recorded during this survey. The vast majority of the birds counted occurred along the Abel Tasman National Park coastline, but smaller numbers of birds were also sparsely distributed along the coastlines of both Golden Bay / Mohua and Tasman Bay / Te Tai-o-Aorere (Figure 3.9). Fourteen largely vacant Spotted Shag / Kawau Tikitiki colonies and/ or roost sites were located during this survey, thirteen of which were situated on cliffs and islands along the Abel Tasman National Park coastline, and one of which was situated on Tokongawha Point, near Mārahau (Figure 3.9). These colonies/roosts were largely vacant at the time we carried out this survey, with the vast majority of birds encountered being in non-breeding plumage.

Spotted Shags / Kawau Tikitiki are distributed mainly around the South Island, with strongholds in the Marlborough Sounds, on Banks Peninsula and along the Otago coast (Robertson *et al.* 2007; Heather & Robertson 2015). The national threat ranking for the Spotted Shag / Kawau Tikitiki has been recently upgraded from Not Threatened to Nationally Vulnerable, based on recent and ongoing declines in the breeding populations on Banks Peninsula and in Wellington Harbour and the Hauraki Gulf. A substantial decline in the Banks Peninsula population since 2010 is of particular concern, due to the fact that the peninsula is estimated to support between 30% and 50% of the national population (Robertson *et al.* 2021).

In the Tasman District, Spotted Shag / Kawau Tikitiki numbers may also be in decline. Counts of the number of Spotted Shags / Kawau Tikitiki roosting at Tata Beach have declined by approximately 83% between 2009 and 2018, which may indicate either a substantial population decline, or a change in local habitat use (Schuckard & Melville 2019). The New Zealand Threat Classification System Birds Assessment Panel currently estimates the national population to be around 30,000 mature birds (https://nztcs.org.nz/assessments/118704 ; accessed 25/01/2022). Given that the majority of the Spotted Shags / Kawau Tikitiki recorded during this survey were observed in close proximity to nesting colonies, it's likely that the majority of the 860 birds counted are breeding along the Tasman District coastline. This being the case, the Tasman District Spotted Shag / Kawau Tikitiki breeding population represents at a minimum 2.8% of the national population of this species. It should be noted however that our population estimate of 860 birds breeding in the Tasman District is likely to be an underestimate of the true breeding population size, due to the fact that a substantial proportion of

birds are likely to have been foraging out at sea at the time these surveys were conducted. To gain a much more accurate and precise estimate of the number of Spotted Shags / Kawau Tikitiki breeding along the Tasman District coastline, we recommend that a boat survey of the Abel Tasman National Park breeding colonies should be carried out during August-October to count the number of occupied nests within each colony. This survey should be considered a particularly high priority given the substantial deterioration that has occurred to the national threat status of this species since 2016, and the evidence we have of a possible recent decline in the Tasman District breeding population.

In the meantime, applying a population estimate of 860 Spotted Shags / Kawau Tikitiki to the regional New Zealand Threat Classification System criteria, and assuming that the Tasman District population is in decline, we recommend that the Spotted Shag / Kawau Tikitiki should be ranked as Regionally Critical in the Tasman District based on criterion B (1/1) 250–1000 mature individuals, predicted decline 50–70% (Townsend *et al.* 2008; Crisp 2020). We also recommend that this ranking be given the qualifiers DPS (Data Poor Size), DPT (Data Poor Trend) and CI (Climate Impacts) according to the qualifier definitions provided by Rolfe *et al.* (2021).

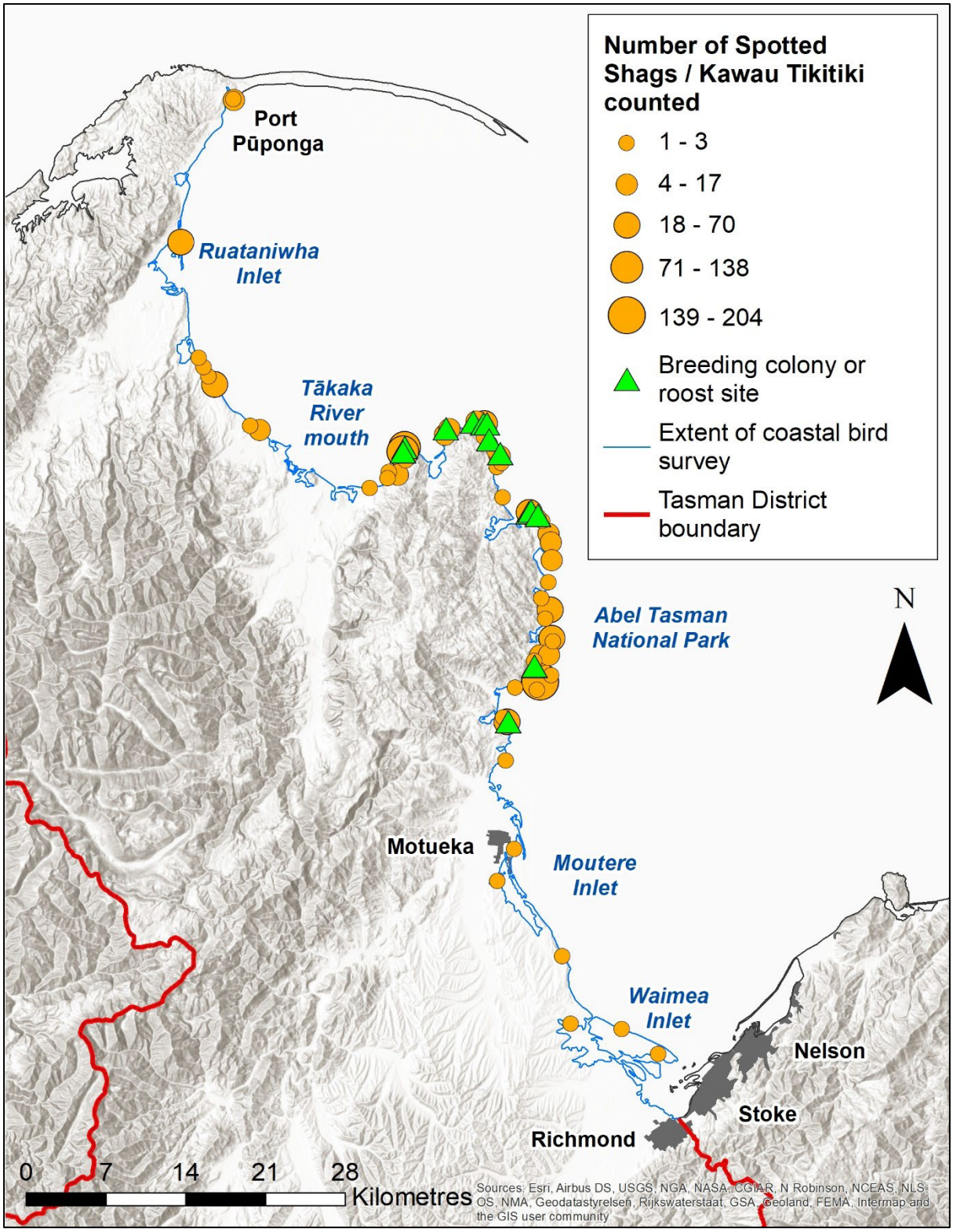

Figure 3.9: Distribution and relative abundance of Spotted Shags / Kawau Tikitiki along the Tasman District coastline.

3.2.6 Reef Heron / Matuku Moana (*Egretta sacra*)

Image courtesy of Duncan Watson/NZ Birds Online

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

Twelve adult Reef Herons / Matuku Moana were counted during this survey, occupying eight (2.5%) of the 315 sections of coastline surveyed (Figure 3.10). Within the Tasman District, Reef Herons / Matuku Moana appear to be largely restricted to the Abel Tasman National Park and adjacent stretches of coastline. Four birds were recorded in eastern Golden Bay / Mohua between Port Tarakohe and Ngawhiti Island, and an additional two birds were encountered in the vicinity of Taupō Point, in northern Abel Tasman National Park. One further bird was encountered at Totaranui Beach, and four more birds were located on Fisherman Island, both locations also situated within Abel Tasman National Park. One bird was also observed near the Riuwaka River mouth (Figure 3.10).

Reef Herons / Matuku Moana appear to be exceedingly rare along the central New Zealand coastline at the present time. The mean of 0.04 birds/km recorded during this survey is similar to the low densities found along other stretches of coastline in the lower North Island and upper South Island. For example, a total of 15 Reef Herons / Matuku Moana were counted along 460 km of coastline (a mean of 0.03 birds/km) in the greater Wellington region in 2017-2018 (McArthur *et al.* 2019) and nine Reef Herons / Matuku Moana were counted along 321 km of coastline (a mean of 0.03 birds/km) in the Hawke's Bay region in January 2021 (McArthur *et al.* 2021b). Similarly, 57 Reef Herons / Matuku Moana were counted along the 1,500 km coastline (a mean of 0.04 birds/km) of the Marlborough Sounds in 2006 (Bell 2010a).

This species appears to have been relatively scarce along the New Zealand coastline since at least the early 20th Century. For example, in 1936 Herbert Guthrie-Smith observed that "[Reef] Herons in fact though widely scattered over New Zealand are nowhere to be found in numbers." (Guthrie-Smith 1936). Within the Tasman District, Reef Herons / Matuku Moana appear to have been largely restricted to the rocky coastline within and adjacent to Abel Tasman National Park since at least the early 1920s (Guthrie-Smith 1936; Edgar 1978; Schuckard & Melville 2019). However, it appears that the abundance of Reef Herons / Matuku Moana has declined considerably along this stretch of coast since the early 1920s. Between November and January 1924, Herbert Guthrie-Smith spent several weeks observing and photographing nesting Reef Herons / Matuku Moana on Ngawhiti Island and at Taupō Point and estimated that 40-50 birds occurred along this stretch of coastline, with up to 15 active and recently-active nests encountered (Guthrie-Smith 1936). The twelve birds counted during this survey therefore suggest that this local population of Reef Herons / Matuku Moana has declined by between 70% and 76% over the past 100 years.

Based on an estimated population of just twelve adult birds, the Reef Heron / Matuku Moana is currently one the rarest breeding bird species that occurs along the Tasman District coastline. Applying this population estimate of twelve birds to the regional New Zealand Threat Classification System criteria, we recommend that this species should be ranked as Regionally Critical in the Tasman District

based on criterion A(1): <250 mature individuals (Townsend *et al.* 2008; Crisp 2020). We recommend that this ranking be given the qualifiers CI (Climate Impacts), CR (Conservation Research Needed) and SO (Secure Overseas) according to the qualifier definitions provided by Rolfe *et al.* (2021).

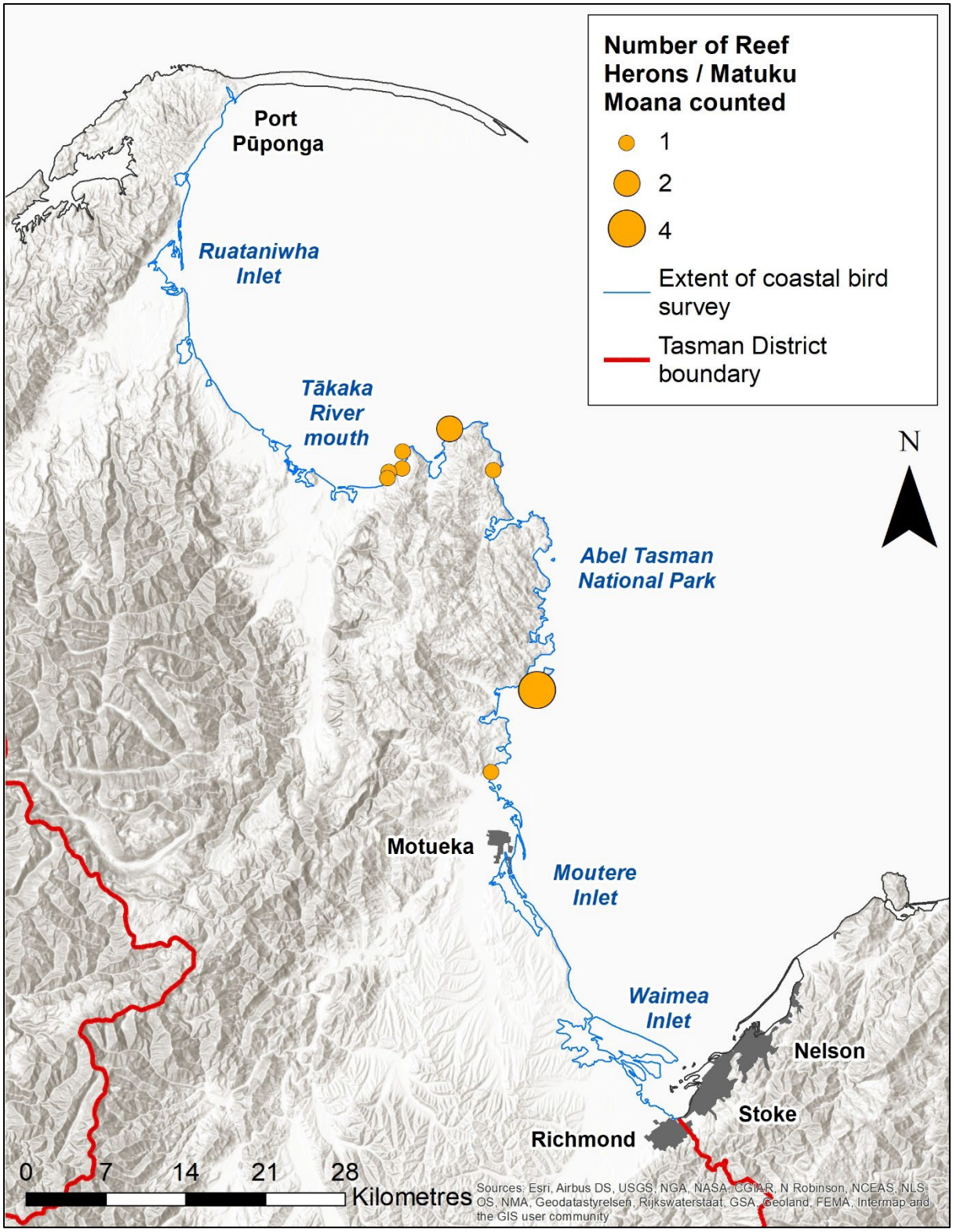

Figure 3.10: Distribution and relative abundance of Reef Herons / Matuku Moana along the Tasman District coastline.

3.2.7 Red Knot / Huahou (*Calidris canutus*)

Image courtesy of Phil Battley/NZ Birds Online

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

Six hundred Red Knots / Huahou were counted during this survey, including 200 birds observed on the Motueka Sandspit and another 400 birds encountered at Bell Island in Waimea Inlet (Figure 3.11).

The Red Knots / Huahou that visit New Zealand each summer breed in Arctic and sub-arctic tundra habitats in eastern Siberia, on the Chukotka Peninsula and the New Siberian Islands, and migrate to south-east Asia and Australasia for the southern hemisphere summer (Higgins & Davies 1996). The Red Knot / Huahou is the second most common Arctic-breeding shorebird that occurs in New Zealand, however the number of birds visiting New Zealand each summer has declined by 37% since the early 1980s (Riegen & Sagar 2020). Between 1983 and 1993 an average of 51,227 birds were counted during Birds New Zealand summer wader surveys each year, whereas an average of 32,080 birds were counted during surveys carried out between 2005 and 2019 (Riegen & Sagar 2020). Coastal mudflats on the shores of the Yellow Sea are an important stopover habitat for this species during migration, so it is likely that recent extensive losses of these habitats due to large-scale land reclamation projects in China and South Korea is the leading cause of the substantial decline observed in this species (Studds *et al.* 2017; Riegen & Sagar 2020). The majority of Red Knots / Huahou that are present in New Zealand each summer are concentrated at a relatively small number of sites including the Kaipara and Manukau Harbours, the Firth of Thames and Farewell Spit (Riegen & Sagar 2020).

Between 2005 and 2019, a mean of 8,184 Red Knots / Huahou were counted on Farewell Spit during Birds New Zealand summer wader counts and mean of 721 birds were counted at sites in Tasman Bay / Te Tai-o-Aorere, including the Motueka Sandspit and Waimea Inlet (Riegen & Sagar 2020). This mean summer count of 8,905 Red Knots / Huahou in the Tasman District between 2005 and 2019 represents an estimated 28% of the New Zealand summer population of this species. Applying a regional summer population estimate of 8,905 Red Knots / Huahou to the NZTCS criteria and assuming that the Tasman District population is declining at a similar rate to the national population (Schuckard & Melville 2013), we recommend that the Red Knot / Huahou should be ranked as Regionally At Risk, Declining in the Tasman District based on criterion A(1/1) 5000–20 000 mature individuals, predicted decline 10–30% (Townsend *et al.* 2008). We also recommend that this ranking be given the qualifiers CI (Climate Impacts) and TO (Threatened Overseas) according to the qualifier definitions provided by Rolfe *et al.* (2021).

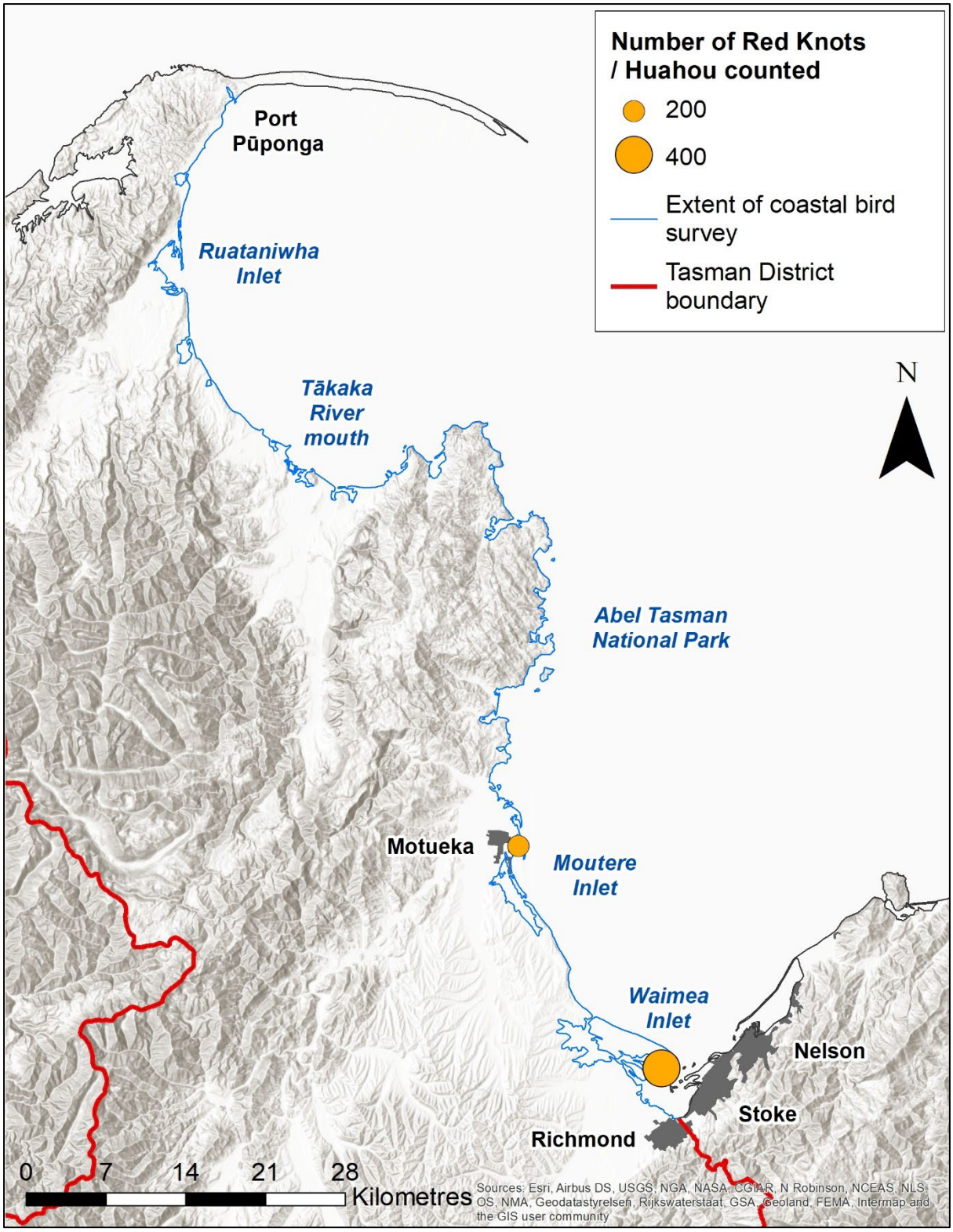

Figure 3.11: Distribution and relative abundance of Red Knots / Huahou along the Tasman District coastline.

3.2.8 Eurasian Whimbrel (*Numenius phaeopus*)

Image courtesy of Scott Brooks/NZ Birds Online

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

Three Eurasian Whimbrels were encountered during this survey, including two birds counted at Kaiteriteri and another bird encountered on the Motueka Sandspit (Figure 3.12).

Eurasian Whimbrels breed throughout northern Eurasia and North America, with five subspecies recognised (Gill *et al.* 2021). One of these subspecies, the Asiatic Whimbrel (*Numenius phaeopus variegatus*), migrates to New Zealand for the southern hemisphere summer (Higgins & Davies 1996). The number of Eurasian Whimbrels visiting New Zealand each summer has declined by 65% since the early 1980s, possibly due to the extensive reclamation of coastal mudflats on the shores of the Yellow Sea, which is an important stopover habitat for this species during migration (Heather & Robertson 2015; Kuang *et al.* 2020). Between 1983 and 1993 an average of 89 birds were counted during Birds New Zealand summer wader surveys each year, whereas an average of 31 birds were counted during surveys carried out between 2005 and 2019 (Riegen & Sagar 2020). The majority of the Eurasian Whimbrels that occur in New Zealand each summer are found on the estuaries and harbours of Northland, Auckland, Waikato and the Bay of Plenty, and at Farewell Spit.

Applying a regional population estimate of three Eurasian Whimbrels to the NZTCS criteria, we recommend that the Eurasian Whimbrel be ranked as a Vagrant in the Tasman District, based on the criterion that the Eurasian Whimbrel is a taxon "whose occurrences, though natural, [is] sporadic and typically transitory, or [a migrant] with fewer than 15 individuals visiting per annum" (Townsend *et al.* 2008). We recommend that this ranking be given the qualifiers CI (Climate Impacts) and SO (Secure Overseas) according to the qualifier definitions provided by Rolfe *et al.* (2021).

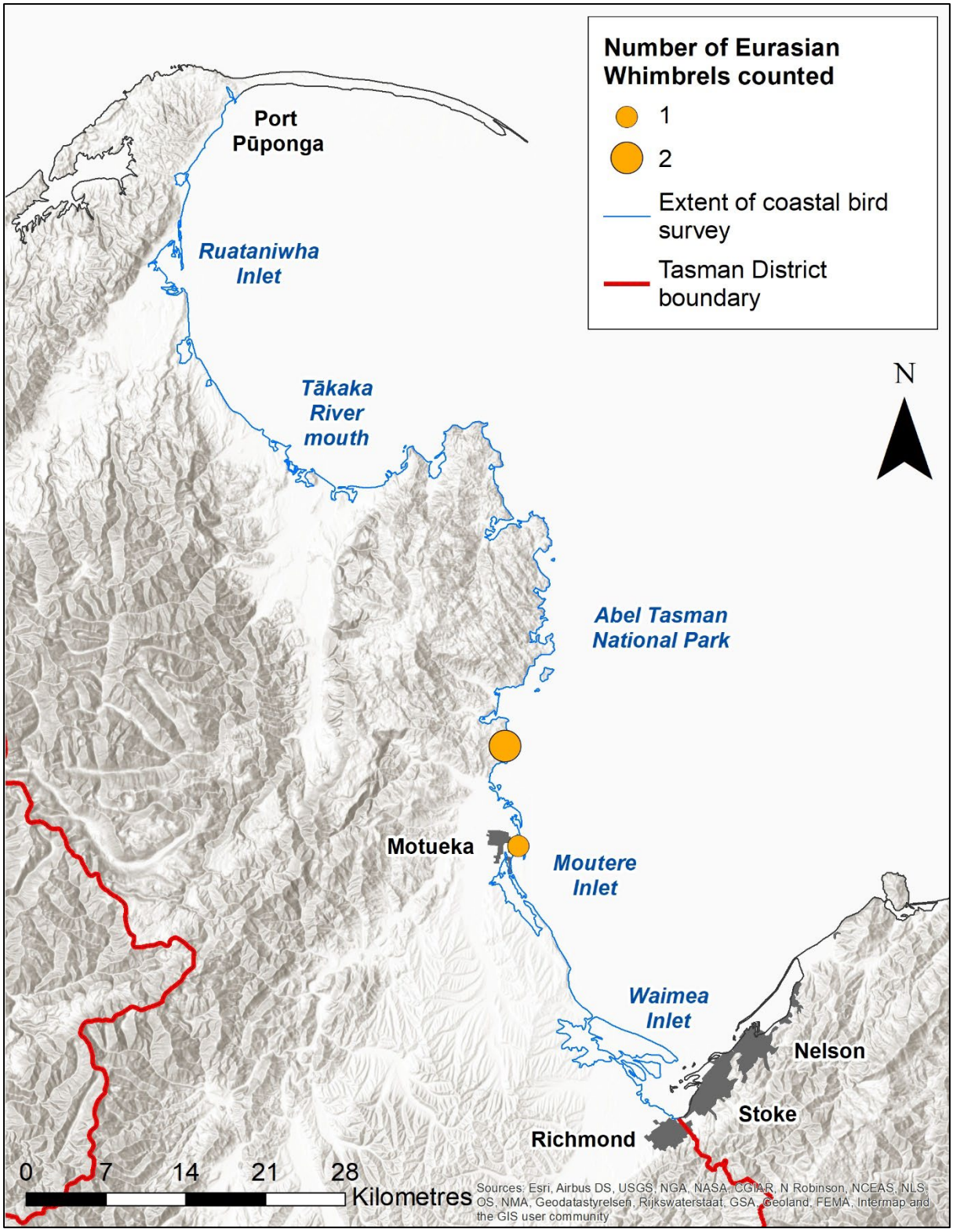

Figure 3.12: Distribution and relative abundance of Eurasian Whimbrels along the Tasman District coastline.

3.2.9 Bar-tailed Godwit / Kuaka (*Limosa lapponica*)

Image courtesy of Phil Battley/NZ Birds Online

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

A total of 5,193 Bar-tailed Godwits / Kuaka was counted during this survey, occupying 47 (14.9%) of the 315 sections of coastline surveyed (Figure 3.13). Bar-tailed Godwits / Kuaka had a clustered distribution along the Tasman District coastline, with the majority of birds found along sections of coastline with large areas of intertidal mudflats, including the coastline between Port Pūponga and Pākawau, the Ruataniwha Inlet, the coastline between Rangihaeata and Pōhara, and the Moutere and Waimea Inlets (Figure 3.13).

The Bar-tailed Godwits / Kuaka that visit New Zealand each summer breed in Alaska and undertake a remarkable non-stop, trans-Pacific migration to spend the southern hemisphere summer at coastal sites in eastern Australia and New Zealand. On their return northward migration, these birds reach Alaska via stop-over sites in eastern Asia, particularly the estuaries of the Yellow Sea (Battley *et al.* 2012). Bar-tailed Godwits / Kuaka are the most common Arctic-breeding shorebird that occurs in New Zealand, however the number of birds visiting New Zealand each summer has declined by 6% since the early 1980s (Riegen & Sagar 2020). Between 1983 and 1993 an average of 83,133 birds were counted during Birds New Zealand summer wader surveys each year, whereas an average of 77,796 birds were counted during summer surveys carried out between 2005 and 2019 (Riegen & Sagar 2020). As for Red Knots / Huahou, coastal mudflats on the shores of the Yellow Sea are an important stopover habitat for this species during migration, so it is likely that recent extensive losses of these habitats due to large-scale land reclamation projects in China and South Korea is the leading cause of the substantial decline observed in this species (Studds *et al.* 2017; Riegen & Sagar 2020). The majority of the Bar-tailed Godwits / Kuaka that occur in New Zealand each year are found on the harbours and estuaries of Northland, Auckland, the Bay of Plenty and in the Nelson-Tasman region, with relatively small numbers present in the lower North Island (Riegen & Sagar 2020). In February 2020, the first dedicated census of Bar-tailed Godwits / Kuaka to be carried out in Australasia resulted in 81,549 birds being counted in New Zealand and a further 34,897 birds were counted in Australia (Schuckard *et al.* 2020b).

Although we recorded a count of 5,193 Bar-tailed Godwits / Kuaka during this survey, our counts were carried out over multiple days and across all states of tide, thereby increasing the likelihood of either double-counting, or not detecting birds. Added to this, our survey did not include a count of the waders on Farewell Spit, due to the fact that this is regularly counted as part of Birds New Zealand's national wader counts. This being the case, our total of 5,193 Kuaka / Bar-tailed Godwits is not an accurate estimate of the number of birds present along the Tasman District coastline. Instead, Birds New Zealand's national summer wader surveys provide a more reliable population estimate for Bar-tailed Godwits / Kuaka in the Tasman District. Between 2005 and 2019, a mean of 6,234 birds were counted during November/December at key roost sites in both Tasman Bay / Te Tai-o-Aorere and in

Golden Bay / Mohua. These counts excluded a mean of 9,591 birds counted on Farewell Spit but included a mean of ca. 1,300 birds counted in Westhaven Inlet (Schuckard and Melville 2013; Riegen & Sagar 2020). Subtracting the 1,300 Westhaven birds from the mean count of 6,234 Bar-tailed Godwits / Kuaka counted in Tasman Bay / Te Tai-o-Aorere and Golden Bay / Mohua between 2005 and 2019 provides a mean count of 4,934 birds – not too dissimilar from the 5,193 Bar-tailed Godwits / Kuaka counted during this survey.

Both Schuckard & Melville (2013) and Riegen & Sagar (2020) have provided recent mean counts of the number of Bar-tailed Godwits / Kuaka present in the Tasman District during summer each year, with the former reporting a mean count of 18,527 birds and the latter reporting a mean count of 15,825 birds. Based on these estimates, the Tasman District currently supports between 19% and 23% of the New Zealand summer population and between 14% and 16% of the Australasian summer population of this species (Schuckard & Melville 2013; Schuckard *et al.* 2020b). Applying this population estimate to the regional NZTCS criteria and assuming that the Tasman District population is declining at a similar rate to the national population, we recommend that the Bar-tailed Godwit / Kuaka should be ranked as At Risk, Declining in the Tasman District based on criterion A(1/1) 5000–20 000 mature individuals, predicted decline 10–30% (Townsend *et al.* 2008; Crisp 2020). We also recommend that this ranking be given the qualifiers CI (Climate Impacts) and TO (Threatened Overseas) according to the qualifier definitions provided by Rolfe *et al.* (2021).

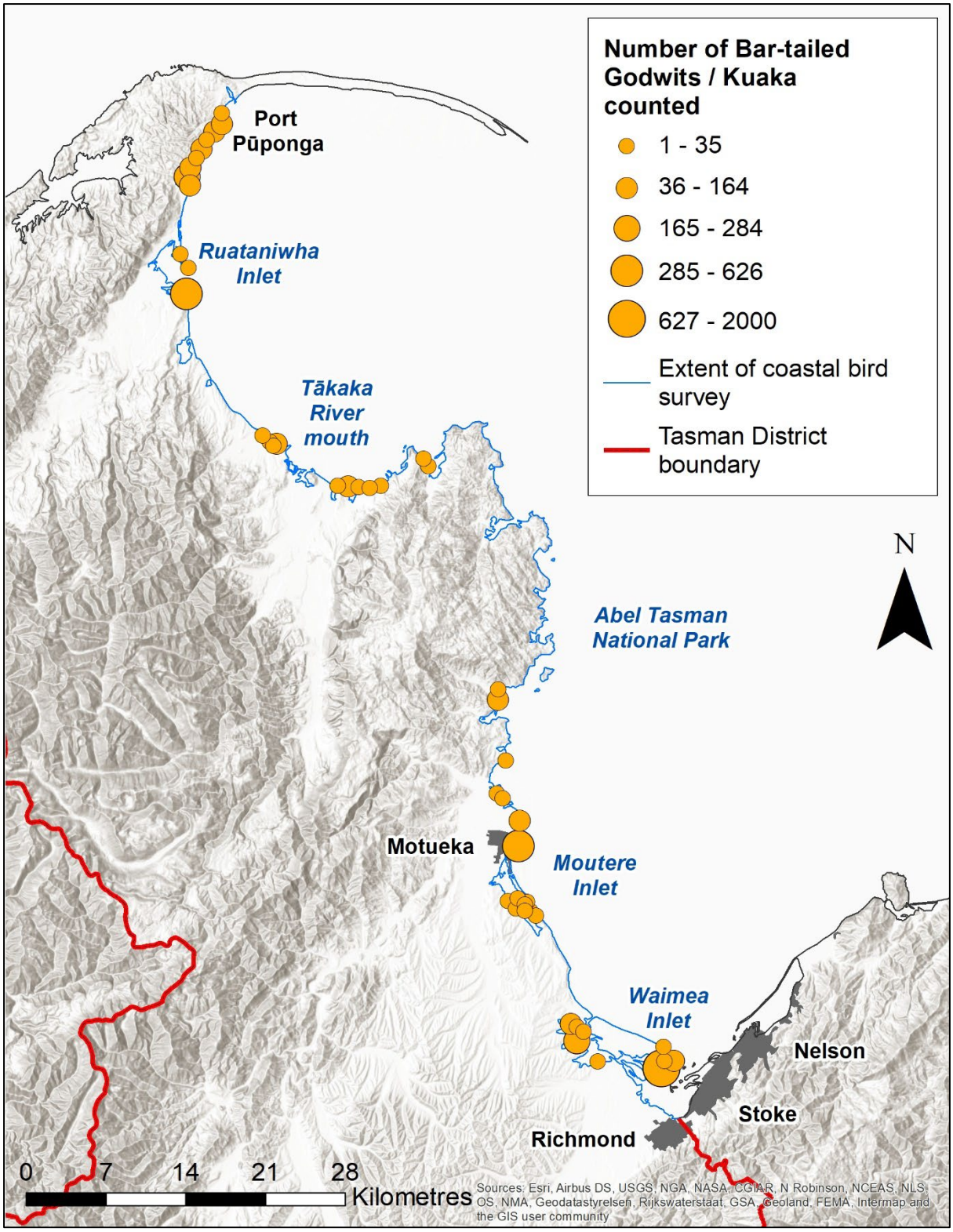

Figure 3.13: Distribution and relative abundance of Bar-tailed Godwits / Kuaka along the Tasman District coastline.

3.2.10 Ruddy Turnstone (*Arenaria interpres*)

Image courtesy of Duncan Watson/NZ Birds Online

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

Two hundred and fifty-four Ruddy Turnstones were encountered during this survey, occupying four (1.3%) of the 315 sections of coastline surveyed (Figure 3.14). All of these birds were encountered in the Moutere Inlet, with the majority of the birds found roosting on the Motueka Sandspit (Figure 3.14).

Ruddy Turnstones breed in Arctic and sub-arctic tundra habitats in northern Eurasia and North America and migrate to southern hemisphere coastlines including Australasia for the southern hemisphere summer (Higgins & Davies 1996). The Ruddy Turnstone is the third most common Arctic-breeding shorebird that occurs in New Zealand, however the number of birds visiting New Zealand each summer has declined by 61% since the early 1980s (Riegen & Sagar 2020). Between 1983 and 1993 an average of 4,227 birds were counted during Birds New Zealand summer wader surveys each year, whereas an average of 1,654 birds were counted during surveys carried out between 2005 and 2019 (Riegen & Sagar 2020). Ruddy Turnstones are less reliant on muddy estuarine habitats than other Arctic-breeding shorebird species, so are considered less vulnerable to habitat loss associated with recent large-scale land reclamation projects in the Yellow Sea. This being the case, the cause(s) for the substantial decline in Ruddy Turnstones observed in New Zealand since 1983 are poorly known at present (Melville *et al.* 2020; Riegen & Sagar 2020).

In addition to the Moutere Inlet, significant numbers of Ruddy Turnstones also occur on Farewell Spit. Between 2005 and 2019, a mean of 333 Ruddy Turnstones were counted on Farewell Spit during Birds New Zealand's national summer wader counts, and over the same time period a mean of 119 birds were counted at Moutere Inlet (Riegen & Sagar 2020). Based on these results, the Tasman District supports an estimated 27% of the national summer population of this species.

Applying a regional population estimate of 452 Ruddy Turnstones to the NZTCS criteria, we confirm that the Ruddy Turnstone should be ranked as a Migrant in the Tasman District based on the criterion that the Ruddy Turnstone is a taxon that "predictably visit[s] New Zealand seasonally as part of [its] normal life cycle (a minimum of 15 individuals known or presumed to visit per annum) but [does] not breed here" (Townsend *et al.* 2008). We recommend that this ranking be given the qualifiers CI (Climate Impacts), CR (Conservation Research Needed) and SO (Secure Overseas) according to the qualifier definitions provided by Rolfe *et al.* (2021).

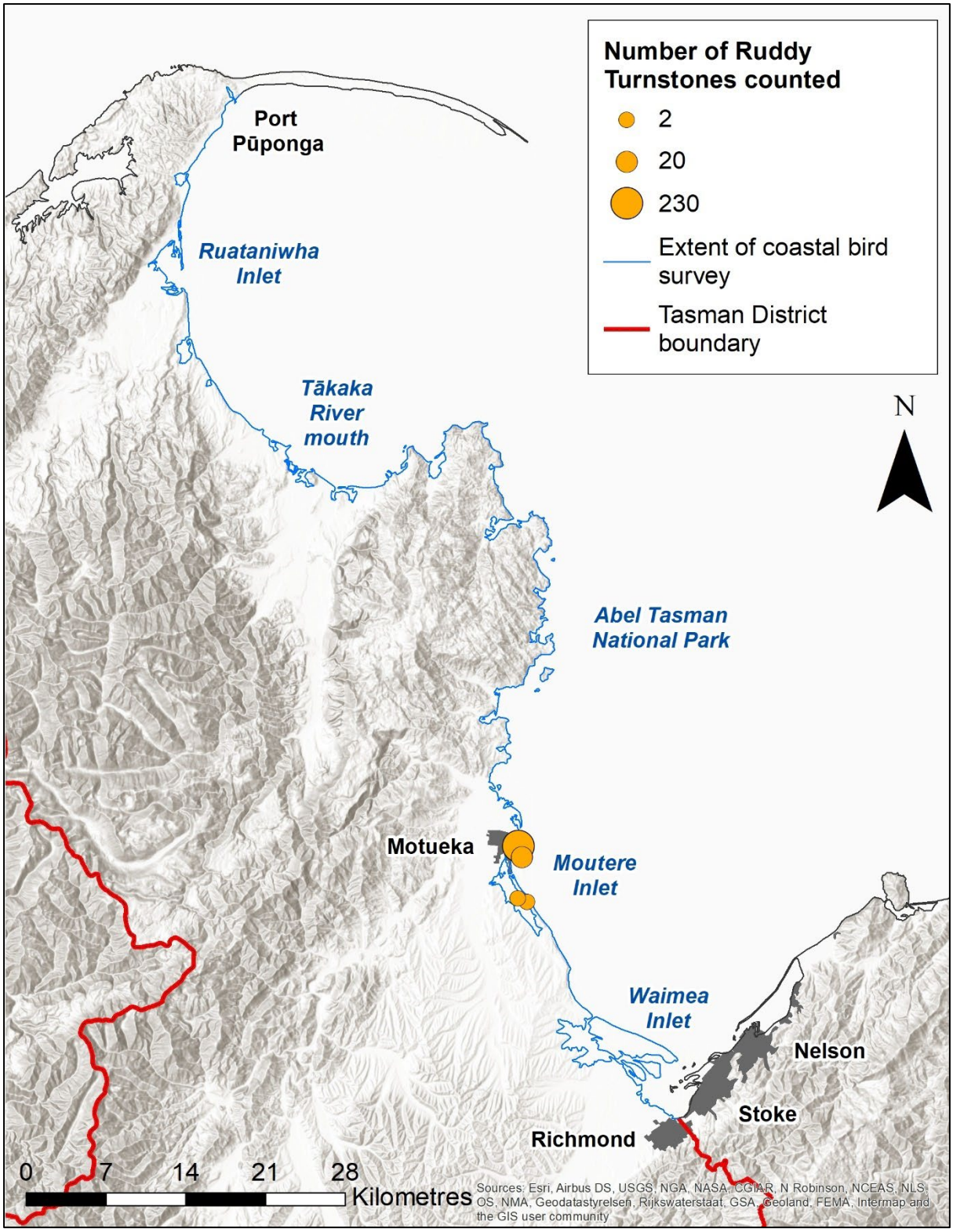

Figure 3.14: Distribution and relative abundance of Ruddy Turnstones along the Tasman District coastline.

3.2.11 Variable Oystercatcher / Tōrea Pango (*Haematopus unicolor*)

Image courtesy of Rebecca Bowater/NZ Birds Online

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

A total of 1,459 Variable Oystercatchers / Tōrea Pango was counted during this survey, occupying 216 (68.6%) of the 315 sections of coastline surveyed (Figures 3.15 and 3.16). The Variable Oystercatcher / Tōrea Pango was one of the most widespread coastal bird species encountered during this survey, with particularly high densities of birds inhabiting the sandy beaches and estuaries of Golden Bay / Mohua and Tasman Bay / Te Tai-o-Aorere, and on the islands in both Waimea Inlet and Abel Tasman National Park. Lower densities of birds were located along the rocky mainland coastline of Abel Tasman National Park southwards to Kaiteriteri, and along 'soft' muddy inland shorelines in both the Moutere and Waimea Inlets (Figures 3.15 and 3.16). A large number of active nests (203) were located during this survey, indicating that Variable Oystercatchers / Tōrea Pango are breeding along almost the entire length of the Tasman District coastline. Along much of the coastline, nests were concentrated within very narrow (ca. 1-10m) strips of suitable nesting habitat between the high tide mark and the seaward edge of terrestrial vegetation. Despite the healthy numbers of Variable Oystercatchers / Tōrea Pango encountered during this survey, it appears that local productivity is highly vulnerable to a range of threats acting on these narrow strips of nesting habitat, including disturbance by people, vehicles and dogs, coastal erosion and storm surge events.

With a mean density of 5.07 birds/km, Variable Oystercatcher / Tōrea Pango densities along the Tasman District coastline are the highest recorded for any region in New Zealand. For example, a total of 347 Variable Oystercatchers / Tōrea Pango were counted along 97 km of the Nelson City coastline during December 2020 (a mean of 3.58 birds/km) (McArthur *et al.* 2021a); 712 Variable Oystercatchers / Tōrea Pango were counted along 460 km of the greater Wellington region coastline during 2017-2018 (a mean of 1.55 birds/km) (McArthur *et al.* 2019), and 516 Variable Oystercatchers / Tōrea Pango were counted along 321 km of the Hawke's Bay coastline in January 2021 (a mean of 1.61 birds/km) (McArthur *et al.* 2021b). Similarly, a total of 730 Variable Oystercatchers / Tōrea Pango were counted along 1,500 km of the Marlborough Sounds coastline in 2006 (a mean of 0.49 birds/km) (Bell 2010b). The much higher densities of Variable Oystercatchers / Tōrea Pango along both the Tasman District and Nelson City coastlines compared to other stretches of central New Zealand coastline is likely due to the much larger areas of intertidal habitats present along the Nelson-Tasman coastline, in comparison to the coastlines of the Hawke's Bay and Greater Wellington regions and in the Marlborough Sounds.

This is the first census count of Variable Oystercatchers / Tōrea Pango that has been carried out along the entire coastlines of both Golden Bay / Mohua and Tasman Bay / Te Tai-o-Aorere, so no information on local population trends is currently available. Nationwide however, Variable Oystercatcher / Tōrea Pango numbers have increased steadily in recent decades. The mean number of Variable Oystercatchers / Tōrea Pango 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 Tūturiwhatu / New Zealand Dotterel (*Charadrius obscurus*) breeding habitats in the northern North Island, although similar increases have also been observed in other parts of New Zealand, including in the Nelson-Tasman region (Riegen & Sagar 2020).

There is currently considerable uncertainty regarding a national population estimate for Variable Oystercatcher / Tōrea Pango. A total of 4,197 birds were counted during the 2019 Birds New Zealand national winter wader count, though this is almost certain to be a significant underestimate of the national population (Riegen & Sagar 2020). Based on national wader count data and the results of a series of regional coastal bird surveys carried out in central New Zealand (Bell 2010b; McArthur *et al.* 2019; McArthur *et al.* 2021a; McArthur *et al.* 2021b; this study), the New Zealand Threat Classification System Birds Assessment Panel have recently estimated a current national population of between 5,000 and 20,000 mature birds (https://nztcs.org.nz/assessments/118867; accessed 24/01/2022). The 1,459 birds encountered along the Tasman District coastline therefore represents between 7% and 27% of the national (and global) population of this species. When combined with the 347 birds recorded along the adjacent Nelson City coastline, the 1,806 birds recorded along the Nelson-Tasman coastline in December 2020 represents between 9% and 36% of the national and global population of this species.

The Tasman District coastline has previously been identified as the most important wintering site for this species in the world (Dowding & Moore 2006; Schuckard & Melville 2013), and this survey demonstrates that the Tasman District coastline provides internationally important breeding habitat for this species as well, supporting largest total number and highest densities of breeding birds anywhere in New Zealand or the world. Tasman Bay / Te Tai-o-Aorere also appears to function as a regional 'nursery area' for young birds dispersing from other regions such as Marlborough and Canterbury (Rowe 2019; Melville *et al.* 2020).

Applying this new population estimate of 1,459 Variable Oystercatchers / Tōrea Pango along the Tasman District coastline to the regional New Zealand Threat Classification System criteria, and assuming that the Tasman District population is increasing at a rate of >10% over three generations, we recommend that the Variable Oystercatcher / Tōrea Pango should be ranked as Regionally At Risk, Recovering in the Tasman District, based on criterion A: 1000–5000 mature individuals or total area of occupancy ≤ 100 ha (1 km^2), and predicted increase > 10% (Townsend *et al.* 2008; Crisp 2020). We also recommend that this ranking be given the qualifiers CI (Climate Impacts), INC (Increasing) and DPT (Data Poor Trend) according to the qualifier definitions provided by Rolfe *et al.* (2021).

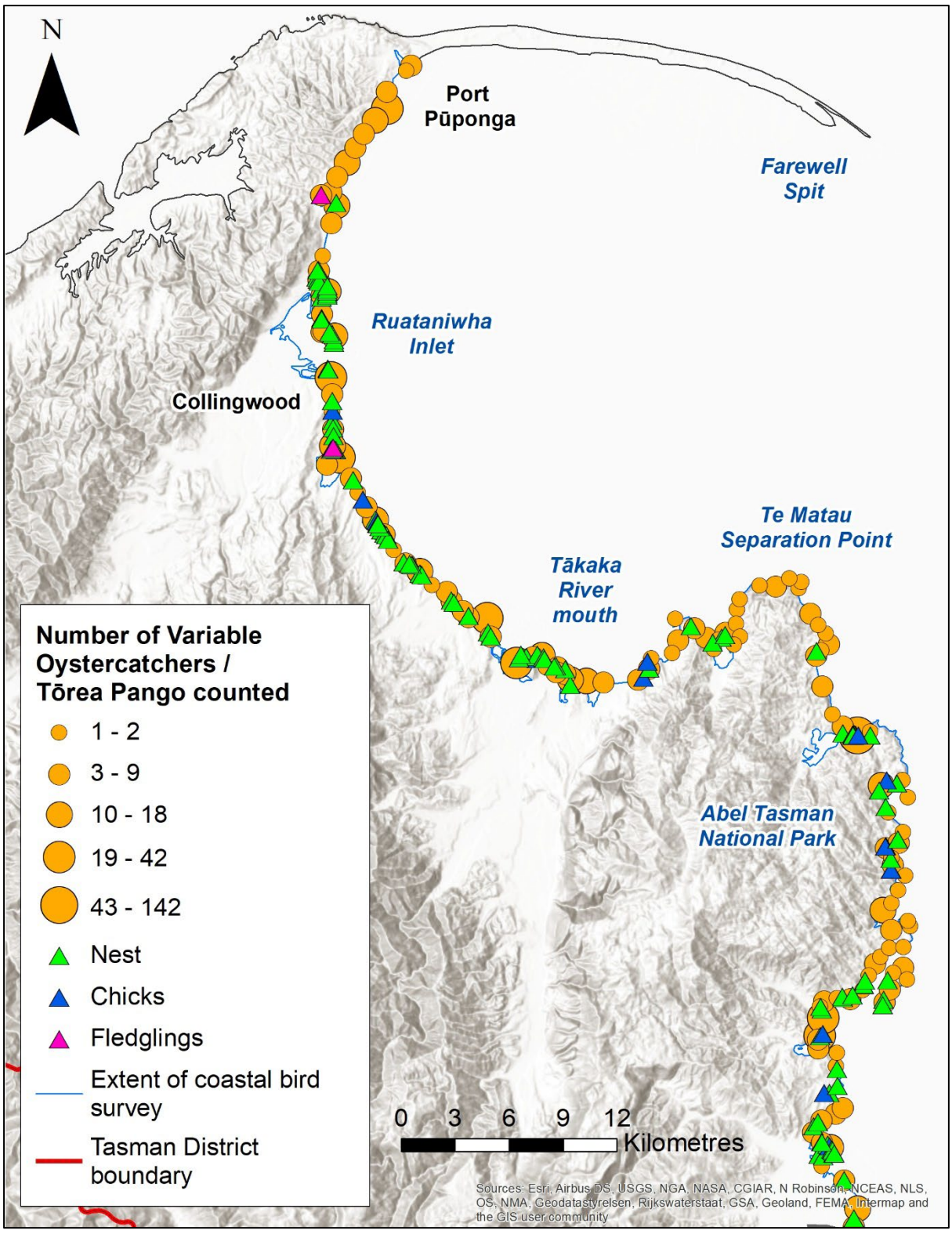

Figure 3.15: Distribution and relative abundance of Variable Oystercatchers / Tōrea Pango along the Golden Bay / Mohua coastline.

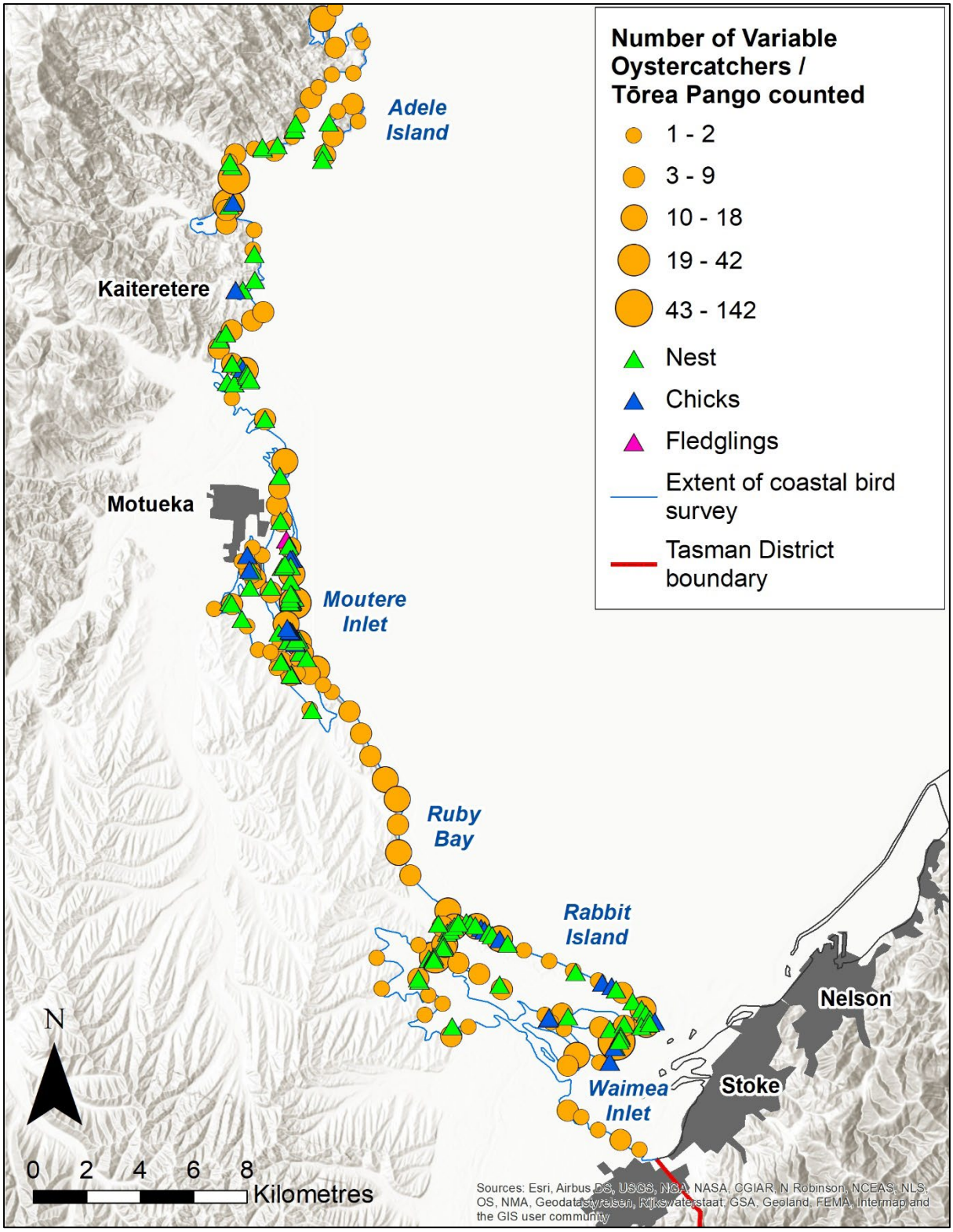

Figure 3.16: Distribution and relative abundance of Variable Oystercatchers / Tōrea Pango along the Tasman Bay / Te Tai-o-Aorere coastline.

3.2.12 South Island Pied Oystercatcher / Tōrea (*Haematopus finschi*)

Image courtesy of Steve Attwood/NZ Birds Online

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

A total of 2,356 SI Pied Oystercatchers / Tōrea were counted during this survey, occupying 75 (23.8%) of the 315 sections of coastline surveyed (Figure 3.17). These birds were fairly uniformly distributed along sandy beaches, and in the estuaries and inlets of both Golden Bay / Mohua and Tasman Bay / Te Tai-o-Aorere but were largely absent from the rocky coastline of Abel Tasman National Park. SI Pied Oystercatchers / Tōrea were particularly common along sections of coastline with large areas of intertidal flats, such as the coast between Port Pūponga and Pākawau, the Motueka River mouth and eastern Waimea Inlet (Figure 3.17).

SI Pied Oystercatchers / Tōrea breed on braided rivers and farmland throughout the South Island and in Hawke's Bay during the spring and summer months, then migrate to estuaries and harbours in the North Island and upper South Island for the non-breeding season (Sagar & Veitch 2014). SI Pied Oystercatchers / Tōrea begin breeding at around 3 years of age, with the majority of subadult birds appearing to remain at estuarine sites all year around. Since 2005, a mean of 17,000 SI Pied Oystercatchers / Tōrea have been recorded during Birds New Zealand summer wader counts at estuaries throughout New Zealand, of which a mean of 4,262 birds (25%) are counted in the Tasman District (Riegen & Sagar 2020). During late summer and autumn, numbers of SI Pied Oystercatchers / Tōrea present at coastal sites around New Zealand increases rapidly as adults and fledglings migrate northwards from their breeding grounds. Since 2015, a mean of 77,095 SI Pied Oystercatchers / Tōrea have been recorded during Birds New Zealand winter wader counts carried out around New Zealand, of which a mean of 14,633 birds (19%) are counted at coastal sites in the Tasman District (Riegen & Sagar 2020).

Although we recorded a count of 2,356 SI Pied Oystercatchers / Tōrea during this survey, our counts were carried out over multiple days and across all states of tide, increasing the likelihood of either double-counting, or not detecting birds. Added to this, our survey did not include a count of the waders on Farewell Spit, due to the fact that this is regularly counted as part of Birds New Zealand's national wader counts. This being the case, our total of 2,356 SI Pied Oystercatchers / Tōrea does not provide an accurate estimate of the number of birds present along the Tasman District coastline. Instead, the mean summer count of 4,262 birds counted at key roost sites in the Tasman District during Birds New Zealand's national summer wader surveys carried out between 2005 and 2019 are likely to provide a more reliable summer population estimate for SI Pied Oystercatchers / Tōrea in the Tasman District (Riegen & Sagar 2020). The Tasman District is an internationally important area for SI Pied Oystercatchers / Tōrea, especially in January/February/March when numbers of birds increase rapidly as birds arrive to undergo moult (Schuckard & Melville 2013; Birds New Zealand unpublished data).

Applying a population estimate of 4,262 (non-breeding) SI Pied Oystercatchers / Tōrea in the Tasman District to the regional New Zealand Threat Classification System criteria, we recommend that this species should be ranked as a Migrant in the Tasman District, based on the criterion that the SI Pied

Oystercatcher / Tōrea is a taxon that "predictably visit[s] the Tasman District seasonally as part of [its] normal life cycle (a minimum of 15 individuals known or presumed to visit per annum) but [does] not breed here" (Townsend *et al.* 2008; Crisp 2020). We recommend that this ranking be given the qualifier CI (Climate Impacts) and CR (Conservation research needed) according to the qualifier definitions provided by Rolfe *et al.* (2021).

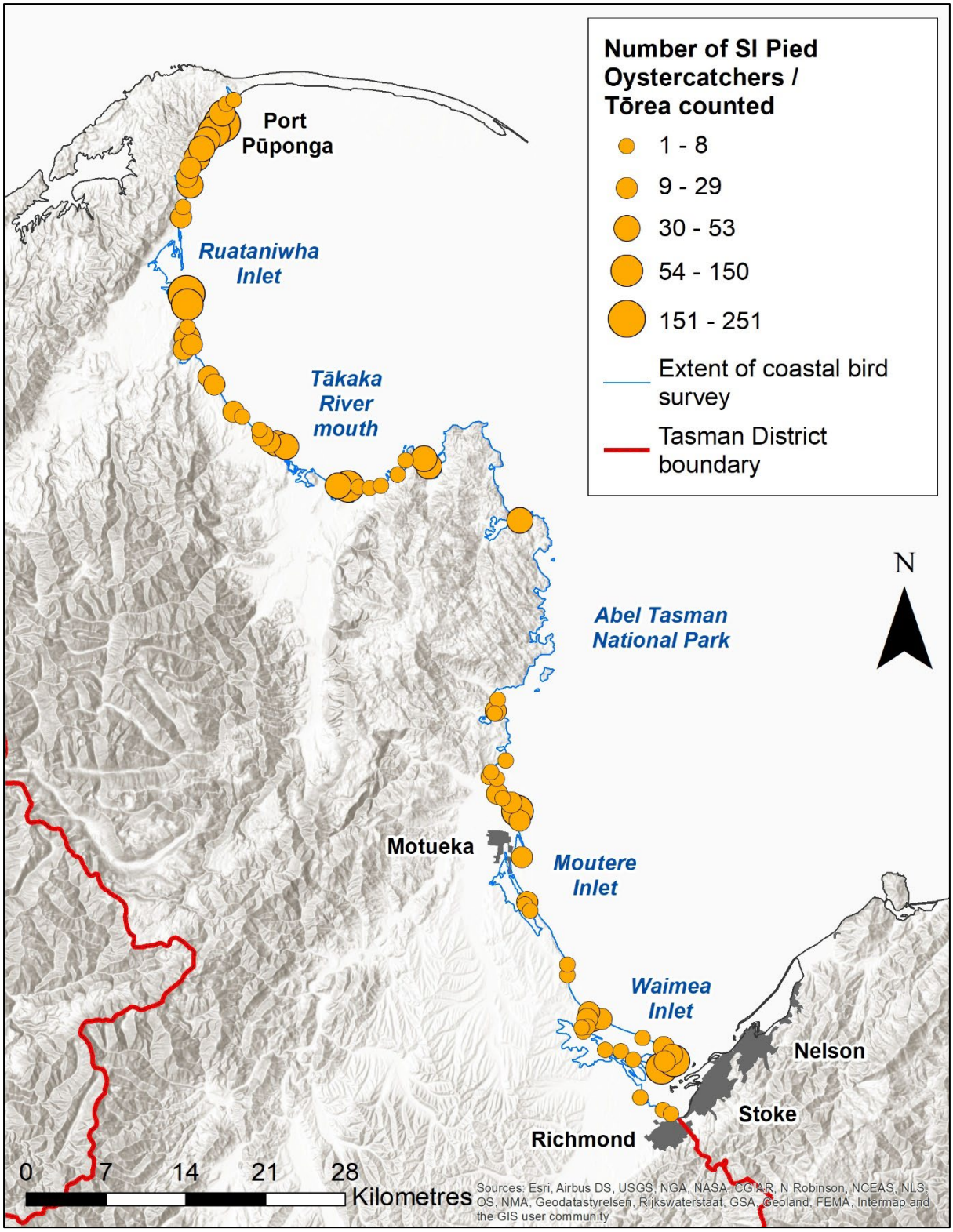

Figure 3.17: Distribution and relative abundance of South Island Pied Oystercatchers / Tōrea along the Tasman District coastline.

3.2.13 Pied Stilt / Poaka (*Himantopus himantopus*)

Image courtesy of Tony Whitehead/NZ Birds Online

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

A total of 344 Pied Stilts / Poaka was counted during this survey, occupying 46 (14.6%) of the 315 sections of coastline surveyed (Figure 3.18). The majority of these birds were found in either the Waimea Inlet or along the Tasman Bay / Te Tai-o-Aorere coastline between Mārahau and Moutere Inlet. Surprisingly few birds were encountered in Golden Bay / Mohua. Nesting was observed at a number of locations along the Tasman Bay / Te Tai-o-Aorere coastline, including at the Riuwaka River mouth and at various locations in Moutere and Waimea Inlets (Figure 3.18).

In the Tasman District, Pied Stilts / Poaka 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 ponds and irrigation dams, and in flat, poorly drained paddocks (Heather & Robertson 2015; eBird 2022). Although it is currently difficult to estimate the number of birds likely to be breeding on inland lakes, ponds, wetlands and wet pasture, we consider it likely to be no more than an additional 500 birds. This being the case, we estimate the regional population of Pied Stilts / Poaka in the Tasman District to be between 344-844 adult birds, representing 1.4% - 3.5% of the estimated national population of 24,000 birds (Riegen and Sagar 2020).

Applying a population estimate of 344-844 Pied Stilts / Poaka to the regional New Zealand Threat Classification System criteria, and assuming a stable population, we recommend that this species should be ranked as Regionally Endangered in the Tasman District based on criterion B (1/1) 250–1000 mature individuals, stable population (Townsend *et al.* 2008; Crisp 2020). We also recommend that this ranking be given the qualifiers DPS (Data Poor Size), DPT (Data Poor Trend), CI (Climate Impacts) and SO (Secure Overseas) according to the qualifier definitions provided by Rolfe *et al.* (2021).

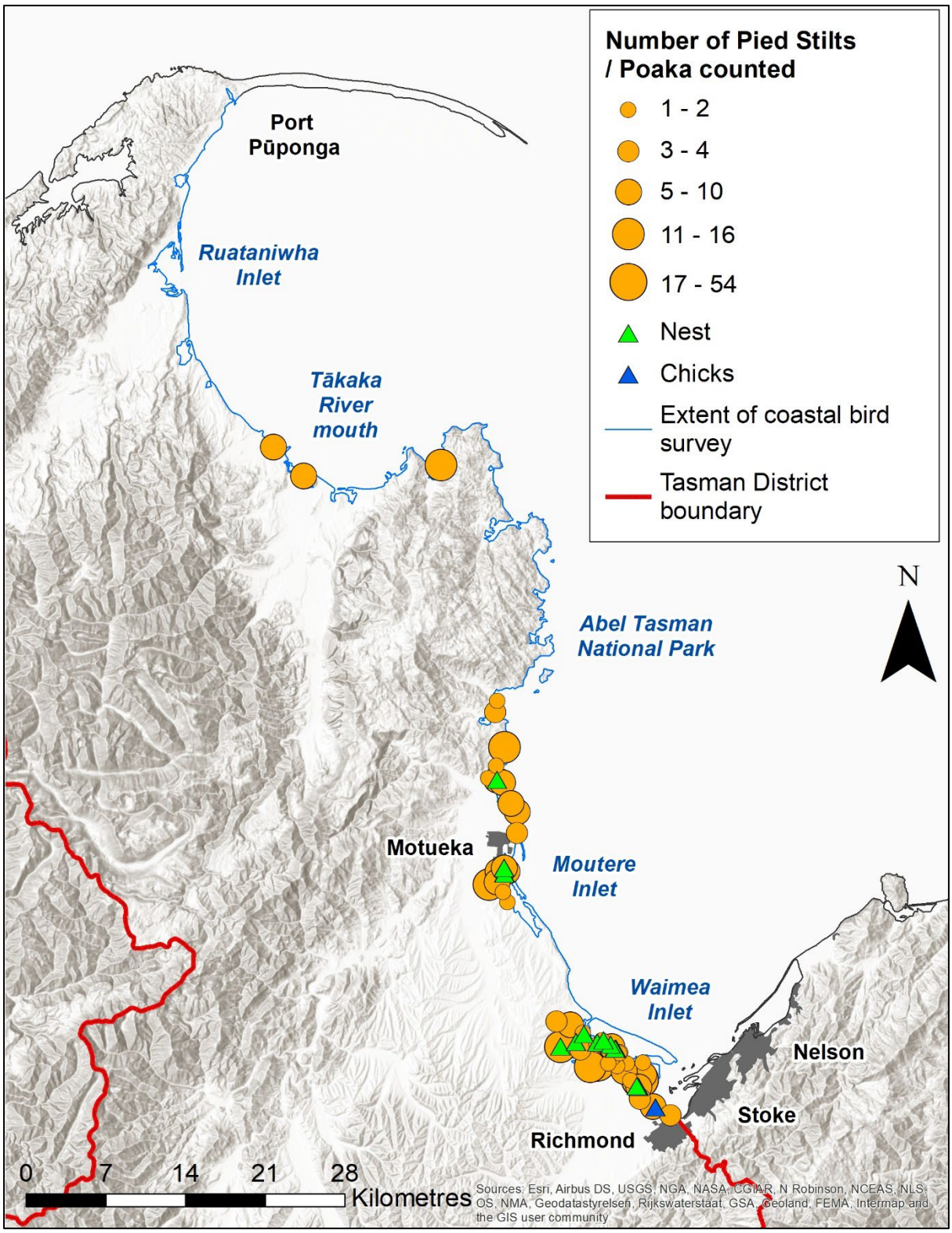

Figure 3.18: Distribution and relative abundance of Pied Stilts / Poaka along the Tasman District coastline.

3.2.14 Banded Dotterel / Pohowera (*Charadrius bicinctus*)

Image courtesy of Rebecca Bowater/NZ Birds Online

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

Forty-two adult Banded Dotterels / Pohowera were counted during this survey, occupying 13 (4.1%) of the 315 sections of coastline surveyed (Figure 3.19). These birds were encountered in a relatively small number of locations along the Tasman District coastline, with the largest concentration of 21 birds (50% of the Tasman District coastal breeding population) found along the Motueka Sandspit (Figure 3.18). A further five birds (12% of the Tasman District coastal breeding population) were encountered on the Collingwood foreshore and another 5 birds were found at Kina Beach (Moutere Inlet). Three birds (7% of the Tasman District coastal breeding population) were found at both the Riuwaka River mouth and at Rototai (near the Motupipi River mouth). Two birds (5% of the Tasman District coastal breeding population) were also encountered at the Pariwhakaoho River mouth and at Mārahau, and a single bird was located at Strong Loop (Moutere Inlet) (Figure 3.19). Banded Dotterel / Pohowera nests and/or chicks were observed at Mārahau, on the Motueka Sandspit and at Kina Beach during this survey (Figure 3.19), and breeding had been observed earlier in the season at the Pariwhakaoho River mouth (Peter Fullerton, personal communication). Although Farewell Spit and the west coast of the Tasman District were not included in this survey, previous Birds New Zealand surveys have confirmed that only a very small number of Banded Dotterels / Pohowera breed on Farewell Spit and they do not appear to be present in significant numbers along the district's western coast (David Melville and Rob Schuckard, personal observation).

With a mean of 0.15 birds counted per km of coastline, breeding Banded Dotterels / Pohowera are comparatively scarce along the Tasman District coastline during the summer months. A similarly low density of birds was recorded along the Nelson City coastline in December 2021, with only eight birds (0.08 birds/km) encountered (McArthur *et al.* 2021a). In contrast, much higher numbers and densities of Banded Dotterels / Pohowera are found along the Wellington and Hawke's Bay coastlines. A total of 346 Banded Dotterels / Pohowera were counted along 460 km of coastline in the Wellington region in November-December 2017-2018 (0.75 birds/km) (McArthur *et al.* 2019) and 395 birds were counted along 321 km of coastline in the Hawke's Bay region in January 2021 (1.23 birds/km) (McArthur *et al.* 2021b). The reason for the scarcity of breeding Banded Dotterels / Pohowera along the Nelson-Tasman coastline appears to be a scarcity of suitable breeding habitat. In the Wellington and Hawke's Bay regions, coastal-breeding Banded Dotterels / Pohowera show a strong preference for sections of coastline that have comparatively wide expanses of unvegetated gravel or sand, which typically occur at river mouths and on coastal headlands (McArthur *et al.* 2019; McArthur *et al.* 2021b). In contrast, the majority of the Tasman District and Nelson City coastlines consists of relatively narrow sandy, stony or boulder beaches; 'soft' shorelines of mudflats, saltmarsh and coastal wetlands; sheer cliffs or rocks, or sections of coastline that have been 'hardened' by the construction of rock revetment and seawalls to control coastal erosion. This being the case, the results of this survey demonstrate that any sites along the Tasman District coastline that support one or more breeding pairs of Banded

Dotterels / Pohowera (≥5% of the Tasman District coastal breeding population) are of regional significance, so should be considered priority sites for conservation management activities designed to mitigate threats to breeding shorebirds, including mammalian predator control and the erection of temporary fencing, signage and trail cameras to monitor and reduce rates of human disturbance.

Due to a scarcity of suitable breeding habitat, the Tasman District coastline only supports a relatively small breeding population of Banded Dotterels / Pohowera. However, the district does provide significant areas of habitat for much larger numbers of non-breeding birds during the winter months, and important stop-over habitat for Banded Dotterels / Pohowera migrating between South Island breeding grounds and non-breeding habitats in both Australia and the northern North Island (Schuckard & Melville 2013; Riegen & Sagar 2020). Between 2005 and 2019, an annual mean of 1,315 Banded Dotterels / Pohowera were counted in the Tasman District during Birds New Zealand winter wader counts, including a mean of 911 birds wintering at Farewell Spit, 229 birds wintering at sites in Golden Bay / Mohua and 175 birds wintering at sites in Tasman Bay / Te Tai-o-Aorere (Riegen & Sagar 2020). Farewell Spit supports the largest winter concentration of Banded Dotterels / Pohowera of any site in New Zealand and is an internationally-important non-breeding site for this species (Riegen & Sagar 2020; Schuckard & Melville 2013). The majority of the Banded Dotterels / Pohowera present in Golden Bay / Mohua during winter are present at Westhaven Inlet, which is a nationally-important non-breeding site for this species (Riegen & Sagar 2020; Schuckard & Melville 2013). In addition to providing important winter habitat for Banded Dotterels / Pohowera, both Farewell Spit and the Motueka Sandspit are important stop-over sites for migrating Banded Dotterels / Pohowera during February, both supporting internationally-significant numbers of migrating birds at this time of the year (Schuckard & Melville 2013).

Given an estimated global Banded Dotterel / Pohowera population of 19,000 birds (Hansen *et al.* 2016), the Tasman District coastline provides breeding habitat for only 0.22% of the global population of this species but provides non-breeding habitat for an estimated 7% of the global population. Applying this new Tasman District breeding population estimate of 42 Banded Dotterels / Pohowera[2] to the regional New Zealand Threat Classification System criteria, we recommend that the Banded Dotterel / Pohowera should be ranked as Regionally Critical in the Tasman District, based on criterion A(1): <250 mature individuals (Townsend *et al.* 2008; Crisp 2020). We also recommend that this ranking be given the qualifiers CI (Climate Impacts) and DPT (Data Poor Trend) according to the qualifier definitions provided by Rolfe *et al.* (2021).

[2] It should be noted that this population estimate does not include birds that may be breeding on shingle riverbeds in the Tasman District. A survey of shorebirds breeding on Tasman District rivers carried out in 2020 however has revealed that very few Banded Dotterels / Pohowera breed on the Tasman District's rivers and that the majority of breeding birds are found along the coastline (Jeroen Lurling, personal communication). This being the case, our estimated regional breeding population of 42 birds is likley to be an underestimate of the total breeding population, but given the apparent scarcity of breeding Banded Dotterels / Pohowera on Tasman District rivers it's highly unlikley that the Tasman District breeding population of Banded Dotterels / Pohowera will exceed the 250 individuals required to warrant the species being ranked as either Regionally Endangered or Regionally Vulnerable in the Tasman District.

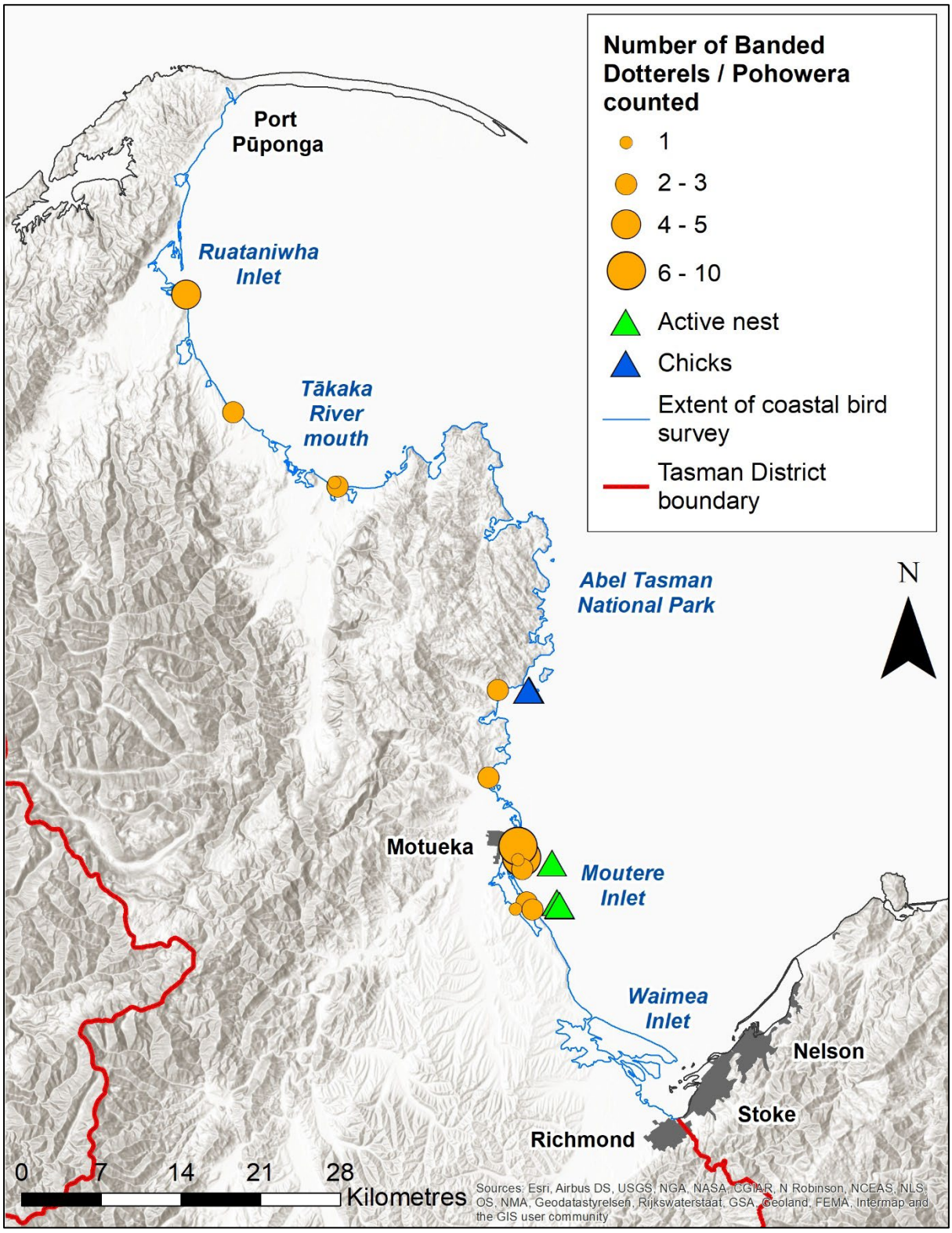

Figure 3.19: Distribution and relative abundance of Banded Dotterels / Pohowera along the Tasman District coastline.

3.2.15 Red-billed Gull / Tarāpunga (*Larus novaehollandiae*)

Image courtesy of Alan Tennyson/NZ Birds Online

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

A total of 1,554 Red-billed Gulls / Tarāpunga was counted during this survey, occupying 144 (45.7%) of the 315 sections of coastline surveyed (Figure 3.20). Red-billed Gulls / Tarāpunga were fairly uniformly distributed along the entire Tasman District coastline, including along both sandy and rocky sections of the coast, and in the district's estuaries and inlets (Figure 3.20). Red-billed Gulls / Tarāpunga were observed nesting at five locations along the Tasman District coastline. The largest nesting colony was located on a sand island at the entrance to Ruataniwha Inlet, north of Collingwood, with 250 adults and 100 chicks present. The second-largest colony was encountered on rock stacks to the east of Port Tarakohe, where 90 adults, 55 active nests and 25 chicks were counted. The third-largest colony was located at Bark Bay in Abel Tasman National Park where 59 adult birds and 18 active nests were counted. The fourth-largest colony was found on a shellbank at Rototai, near the Motupipi River mouth where 29 adults and 16 active nests were counted, and the fifth-largest colony occurred on Torlesse Rock near Kaiteriteri, where 97 adults and 12 active nests were counted (Figure 3.20).

Due to the advanced stage of nesting by locally-breeding Red-billed Gulls / Tarāpunga at the time of this survey, it was not possible to obtain an accurate estimate of the size of the Tasman District breeding population of this species from our survey data. Ideally, any breeding population estimate should be based on a count of the number of occupied nests during peak incubation. That said, we recorded a total of 101 active nests, 125 chicks and 525 adult Red-billed Gulls / Tarāpunga at these five breeding colonies, which provides a conservative estimate of the Tasman District breeding population during the 2020-2021 season of 525 adult birds. To gain a more accurate and precise estimate of the number of Red-billed Gulls / Tarāpunga breeding along the Tasman District coastline, we recommend that an annual survey of active colonies be carried out during the month of November to count the number of occupied nests in any colonies located.

This is the first attempt at a regional census count of Red-billed Gulls / Tarāpunga that has been carried out along the entire Tasman District coastline, so no information on regional population trends is currently available. The national population has declined by at least 25% since the early 1960s however, from an estimated 80,000 breeding birds in 1960 (Gurr & Kinsky 1965) to between 55,662 and 60,000 breeding birds in 2014-2016 (Frost & Taylor 2018). The current national NZTCS ranking for this species is based on an assumption that the species is declining at a rate of between 10% and 50% over three generations (Robertson *et al.* 2021). Assuming a national breeding population of 55,662 – 60,000 birds, the 525 adult Red-billed Gulls / Tarāpunga encountered at nesting colonies along the Tasman District coastline during this survey represents 0.9% of the national population.

Applying a regional population estimate of 525 breeding Red-billed Gulls / Tarāpunga to the NZTCS criteria and assuming that the population is declining at a rate of between 10% and 50% every three generations, we recommend that the Red-billed Gull / Tarāpunga should be ranked as Regionally Endangered in the Tasman District based on criterion A (1/1) 250–1000 mature individuals, predicted decline 10–50% (Townsend *et al.* 2008; Crisp 2020). We also recommend that this ranking be given the qualifiers DPS (Data Poor Size), DPT (Data Poor Trend) and CI (Climate Impacts) according to the qualifier definitions provided by Rolfe *et al.* (2021).

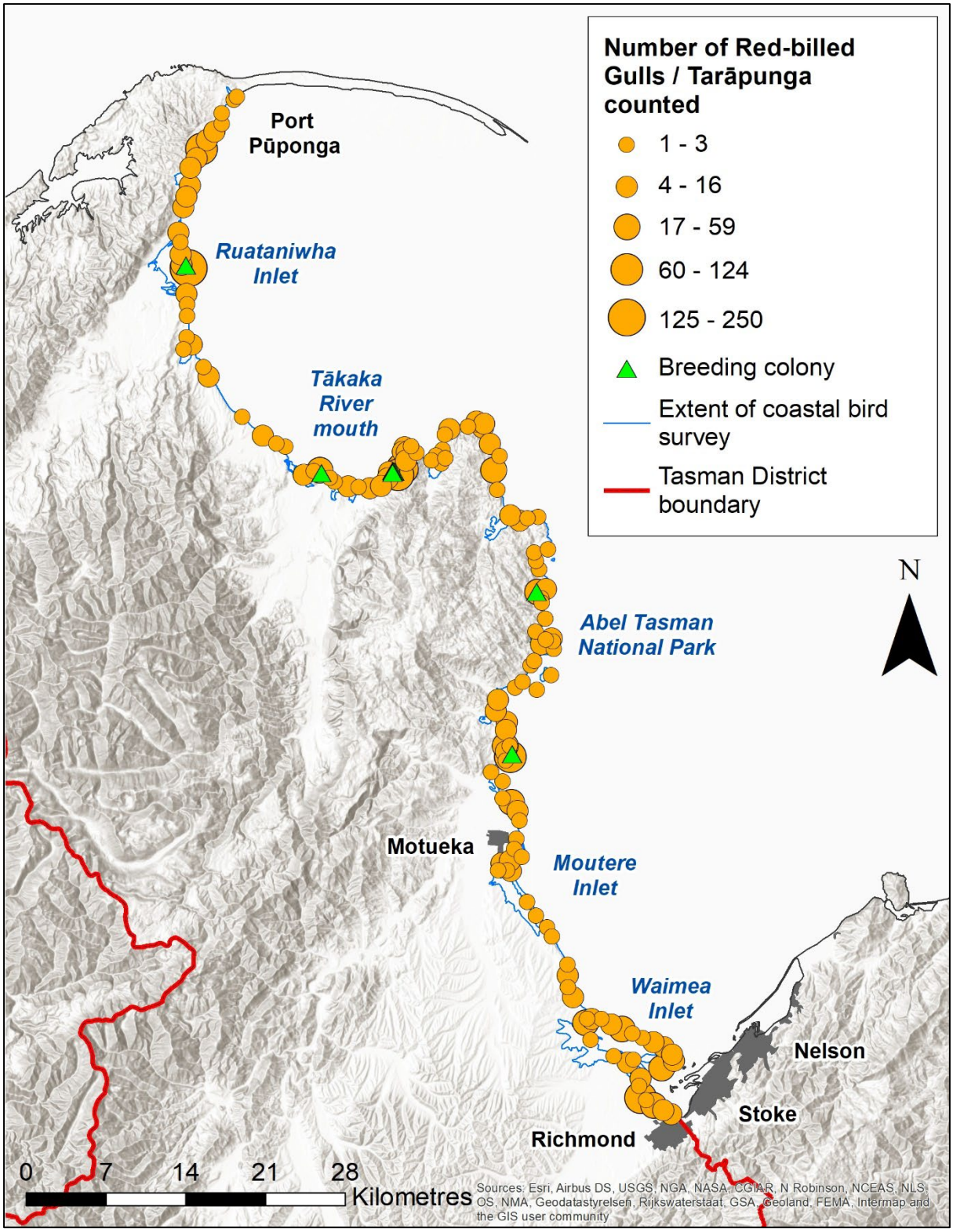

Figure 3.20: Distribution and relative abundance of Red-billed Gulls / Tarāpunga along the Tasman District coastline.

3.2.16 Black-billed Gull / Tarāpuka

Image courtesy of Steve Attwood/NZ Birds Online

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

Two hundred and thirty-one Black-billed Gulls / Tarāpuka were counted during this survey, occupying 19 (6.0%) of the 315 sections of coastline surveyed (Figure 3.21). The majority of these birds were encountered on sandy beaches and in the estuaries and inlets of Golden Bay / Mohua and Abel Tasman National Park, with fewer birds encountered in Tasman Bay / Te Tai-o-Aorere (Figure 3.21). Black-billed Gulls / Tarāpuka were found to be nesting at two locations in the Tasman District during this survey. One hundred and fifty adults and 25 chicks were present on a sand island at the mouth of the Ruataniwha Inlet just north of Collingwood, and a single bird incubating a clutch of two eggs was found on a shellbank at Rototai, near the Motupipi River mouth. Black-billed Gulls / Tarāpuka have been nesting at the former location since at least 1924, when Herbert Guthrie-Smith encountered a colony of between 3000 and 4000 birds incubating eggs and guarding chicks (Guthrie-Smith 1936). During the 2020 breeding season, a nesting colony containing 110 nests (and estimated 220 breeding birds) was also encountered on the Matakitaki River downstream of Mole Stream, although by the time the colony had been found, the majority of the nests had been depredated, likely by Southern Black-backed Gulls / Karoro (*Larus dominicanus*) (Trevor James, personal communication). In recent years, Black-billed Gulls / Tarāpuka have also been recorded nesting at both the Motueka Sandspit and at Sand Island in Waimea Inlet (Schuckard & Melville 2019). While the majority of the adult birds encountered along the Tasman District coastline during this survey are likely to be breeding locally, re-sightings of colour-banded birds in the district have confirmed that at least some of the birds present along the Tasman District coastline breed at colonies on the Wairau River in Marlborough (Schuckard & Melville 2019; eBird 2022). In at least two cases, birds that had attempted to nest on the Wairau River but got washed out then joined a nesting colony at Motueka Sandspit during the same breeding season, although it is uncertain whether they attempted a second nesting (David S. Melville, personal observation).

Due to methodological differences between the two earlier national censuses of Black-billed Gulls / Tarāpuka carried out between 1995-1998 and 2014-2017, there is some uncertainty over both the national population trend for this species, and the recent population trend in the Tasman District (Mischler 2018; Robertson *et al.* 2021). The national threat ranking for the Black-billed Gull / Tarāpuka has recently been downgraded from Nationally Critical to At Risk, Declining, based on work by Mischler (2018) which has shown that the national population isn't declining as rapidly as previously feared (Robertson *et al.* 2021). Although Mischler (2018) concluded that the national population is likely to be stable, the Department of Conservation's NZTCS birds assessment panel has taken a precautionary approach and ranked this species based on an assumed rate of decline of between 10 – 50% due to some continuing uncertainty over national population trends (Robertson *et al.* 2021).

Based on the results described above, we estimate that the regional breeding population of Black-billed Gulls / Tarāpuka in the Tasman District is between 152 and 372 birds[3], which in turn represents an estimated 0.12 - 0.19% of the national population of 120,512 breeding birds (Mischler 2018). Applying a population estimate of 372[2] Black-billed Gulls / Tarāpuka in the Tasman District to the regional New Zealand Threat Classification System criteria, and assuming that the Tasman District population is declining at a rate of between 10 and 50% every three generations, we recommend that this species should be ranked as Regionally Endangered in the Tasman District, based on criterion A (1/1): 250–1000 mature individuals, predicted decline 10–50% (Townsend *et al.* 2008; Crisp 2020). We recommend that this ranking be given the qualifiers DPS (Data Poor Size), DPT (Data Poor Trend) and CI (Climate Impacts) according to the qualifier definitions provided by Rolfe *et al.* (2021).

[3] The estimate of 152 birds represents the number of adults counted at coastal breeding colonies located during this survey and the estimate of 372 birds includes an estimate of 220 birds breeding at the colony found on the Matakitaki River during the same season. Note, the Matakitaki River colony wasn't found until the majority of nests had already failed, so we can't exclude the possibility that a number of the nests in the colony were either 'practice' or repeat nesting attempts. This being the case, the true number of Black-billed Gulls / Tarāpuka known to be breeding in the Tasman District during the 2020 breeding season is likely to be somewhere between these two estimates but much closer to the higher of the two estimates.

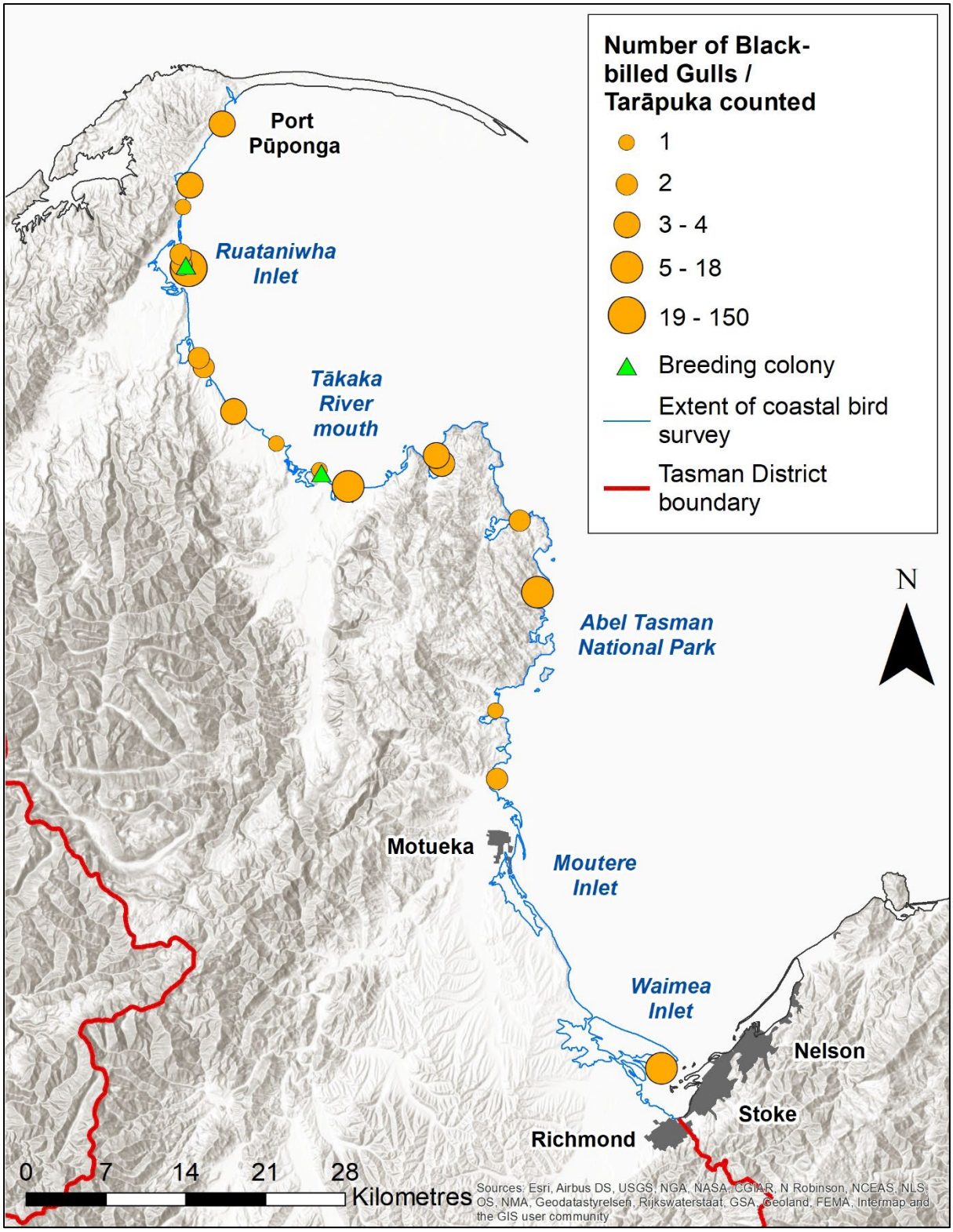

Figure 3.21: Distribution and relative abundance of Black-billed Gulls / Tarāpuka along the Tasman District coastline.

3.2.17 Caspian Tern / Taranui (*Hydroprogne caspia*)

Image courtesy of Les Feasey/NZ Birds Online

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

Two hundred and thirty-two adult Caspian Terns / Taranui were counted during this survey, occupying 54 (17.1%) of the 315 sections of coastline surveyed (Figure 3.22). Caspian Terns / Taranui were fairly uniformly distributed along sandy stretches of coastline in both Golden Bay / Mohua and Tasman Bay / Te Tai-o-Aorere but were much scarcer along the rocky coastline of Abel Tasman National Park (Figure 3.22). Two breeding colonies were encountered along the Tasman District coastline during the survey. One colony was located on a shellbank at Rototai near the mouth of the Motupipi River, where 73 adults and 31 chicks were counted on the 12th of December, and the other colony was located on a shellbank at Bell Island in eastern Waimea Inlet. At this latter colony, a total of 82 adults and 30 chicks was counted on the 11th of December 2020, and 16 of these chicks were subsequently caught and banded by members of the Nelson Region of Birds New Zealand on the 16th of December 2020 (Quayle 2021).

Caspian Terns / Taranui are a cosmopolitan species that is sparsely distributed throughout Eurasia, Africa, Australasia and North and Central America (Higgins & Davies 1996). In New Zealand, Caspian Terns / Taranui are widespread around the mainland coastline and are occasionally encountered well inland on larger rivers and lakes (Heather & Robertson 2015; eBird 2022). Caspian Terns / Taranui have nested at Bell Island since at least the early 1990s, and at Rototai since at least the early 1970s (Bell & Bell 2008), and these were two of only six known nesting colonies in the South Island during the 2020-2021 breeding season (Eagles 2021). With an estimated national population of between 2600 and 2800 breeding adults (Bell & Bell 2008), the 155 adult Caspian Terns / Taranui counted at the Bell Island and Rototai nesting colonies in December 2020 represent 5.5 – 5.9% of the national population of this species.

Assuming the 155 adult birds counted at the Bell Island and Rototai breeding colonies had bred at these respective colonies during the 2020 breeding season, and assuming that some of the 232 Caspian Terns / Taranui counted along the Tasman District coastline may have been double-counted, we estimate that the Tasman District supports a breeding population of between 155 and 232 Caspian Terns / Taranui. Applying this population estimate to the regional New Zealand Threat Classification System criteria and assuming a stable population, we recommend that the Caspian Tern / Taranui should be ranked as Regionally Critical in the Tasman District based on criterion A(1): <250 mature individuals (Townsend *et al.* 2008; Crisp 2020). We recommend that this ranking be given the qualifiers Sp (Biologically Sparse), CI (Climate Impacts) and SO (Secure Overseas) according to the qualifier definitions provided by Rolfe *et al.* (2021).

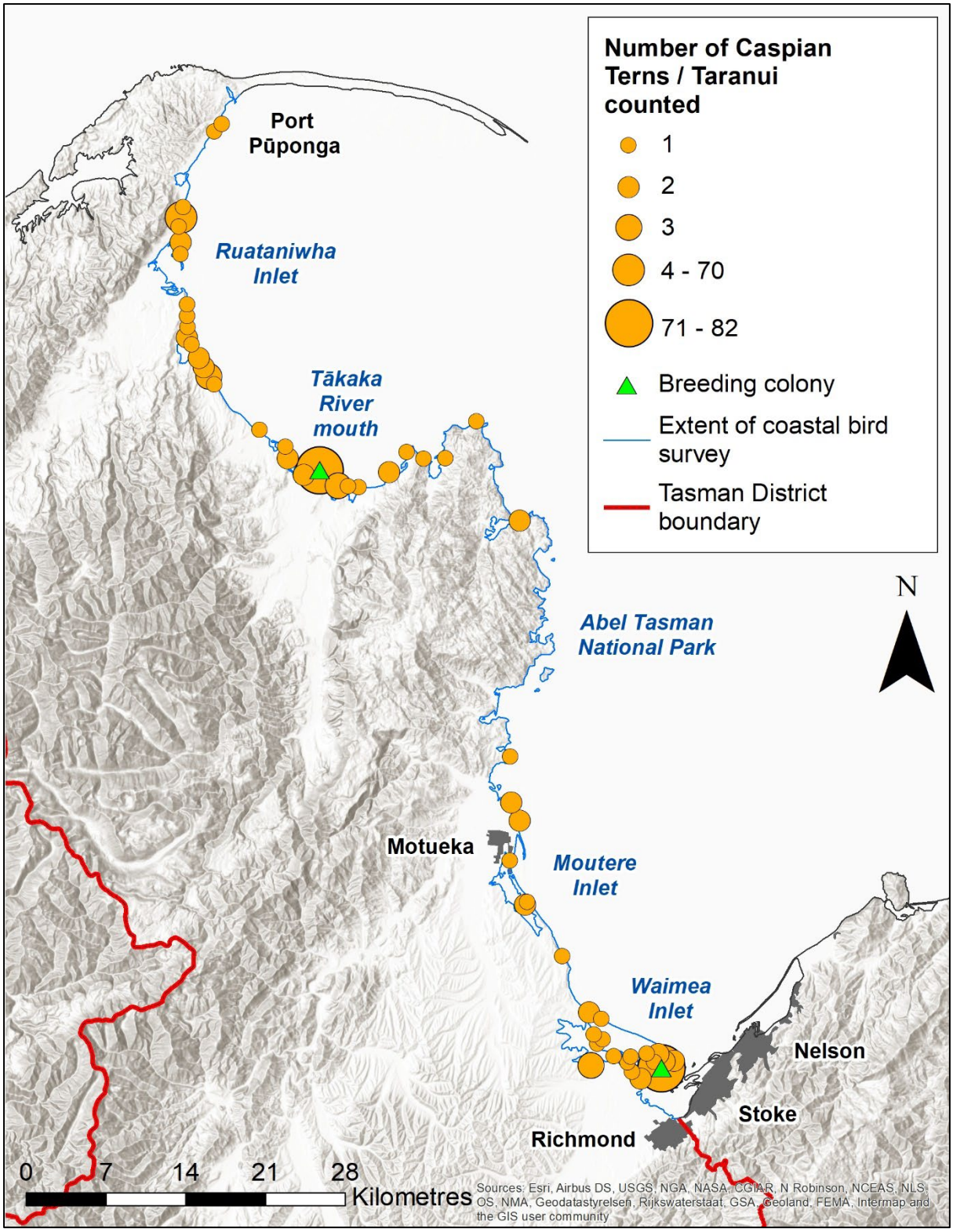

Figure 3.22: Distribution and relative abundance of Caspian Terns / Taranui along the Tasman District coastline.

3.2.18 White-fronted Tern / Tara (*Sterna striata*)

Image courtesy of Rebecca Bowater/NZ Birds Online

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

Three hundred and thirty-five adult White-fronted Terns / Tara were counted during this survey, occupying 62 (19.7%) of the 315 sections of coastline surveyed (Figure 3.23). White-fronted Terns / Tara were particularly common in Golden Bay / Mohua between Port Pūponga and the Takaka River mouth and in Waimea Inlet but were more patchily distributed along the Abel Tasman National Park coastline and along the Tasman Bay / Te Tai-o-Aorere coastline (Figure 3.23). White-fronted Terns / Tara were found to be nesting at two locations in the Tasman District during this survey. One hundred adults and 66 chicks were present on a sand island at the mouth of the Ruataniwha Inlet just north of Collingwood, and another eight adults and ten chicks were encountered on a shellbank at Rototai, near the Motupipi River mouth. White-fronted Terns / Tara have been nesting at the former location since at least 1924, when Herbert Guthrie-Smith encountered a colony of between 12,000 and 15,000 birds on nests (Guthrie-Smith 1936). The presence of this enormous colony in 1924 suggests that White-fronted Terns / Tara have experienced a substantial population decline in the Tasman District over the past 100 years. In 1938, Perrine Moncrieff identified two potential agents of early 20th Century decline, noting that in the vicinity of Nelson "these unfortunate birds are shot from launches and their nests molested" (Moncrieff 1938). This despite the fact that White-fronted Terns / Tara have enjoyed varying levels of legal protection since as early as 1906 (Miskelly 2014).

The number of adults, chicks, fledglings and nests counted at these colonies are almost certain to be an underestimate of the size and productivity of these colonies due to the fact that it was apparent that a number of chicks had already successfully fledged from these colonies by the time that this survey was carried out. Due to the advanced stage of nesting by locally-breeding White-fronted Terns / Tara at the time of this survey, it was not possible to obtain an accurate estimate of the size of the Tasman District breeding population of this species from our survey data. Ideally, any breeding population estimate should be based on a count of the number of occupied nests during peak incubation. That said, we recorded a total of 110 adult White-fronted Terns / Tara at the two breeding colonies encountered during this survey, which provides a conservative approximation of the Tasman District breeding population during the 2020-2021 season. To gain a more accurate and precise estimate of the number of White-fronted Terns / Tara breeding along the Tasman District coastline, we recommend that an annual survey of colonies should be carried out during the month of November to count the number of occupied nests in any colonies located.

This is the first attempt at a regional census count of White-fronted Terns / Tara that has been carried out along the entire Tasman District coastline, so no information on regional population trends is currently available. Knowledge of the national population size and trend is similarly poor. The national population was estimated to total between 24,000 and 30,000 birds in the late 1990s (Taylor 2000), however the population appears to have declined over the past several decades (Taylor 2000; Heather

& Robertson 2015). The current national NZTCS ranking for this species is based on an assumption that the species is declining at a rate of between 10% and 50% over three generations (Robertson *et al.* 2021). Assuming a national population of 24,000 – 30,000 birds, the 110 adult White-fronted Terns / Tara encountered at nesting colonies along the Tasman District coastline during this survey represents 0.36 – 0.45% of the national population.

Applying a regional population estimate of 110 breeding White-fronted Terns / Tara to the NZTCS criteria, we recommend that the White-fronted Tern / Tara should be ranked as Regionally Critical in the Tasman District, based on criterion A(1): <250 mature individuals (Townsend *et al.* 2008; Crisp 2020). We also recommend that this ranking be given the qualifiers DPS (Data Poor Size), DPT (Data Poor Trend), CI (Climate Impacts) and CR (Conservation Research Needed) according to the qualifier definitions provided by Rolfe *et al.* (2021).

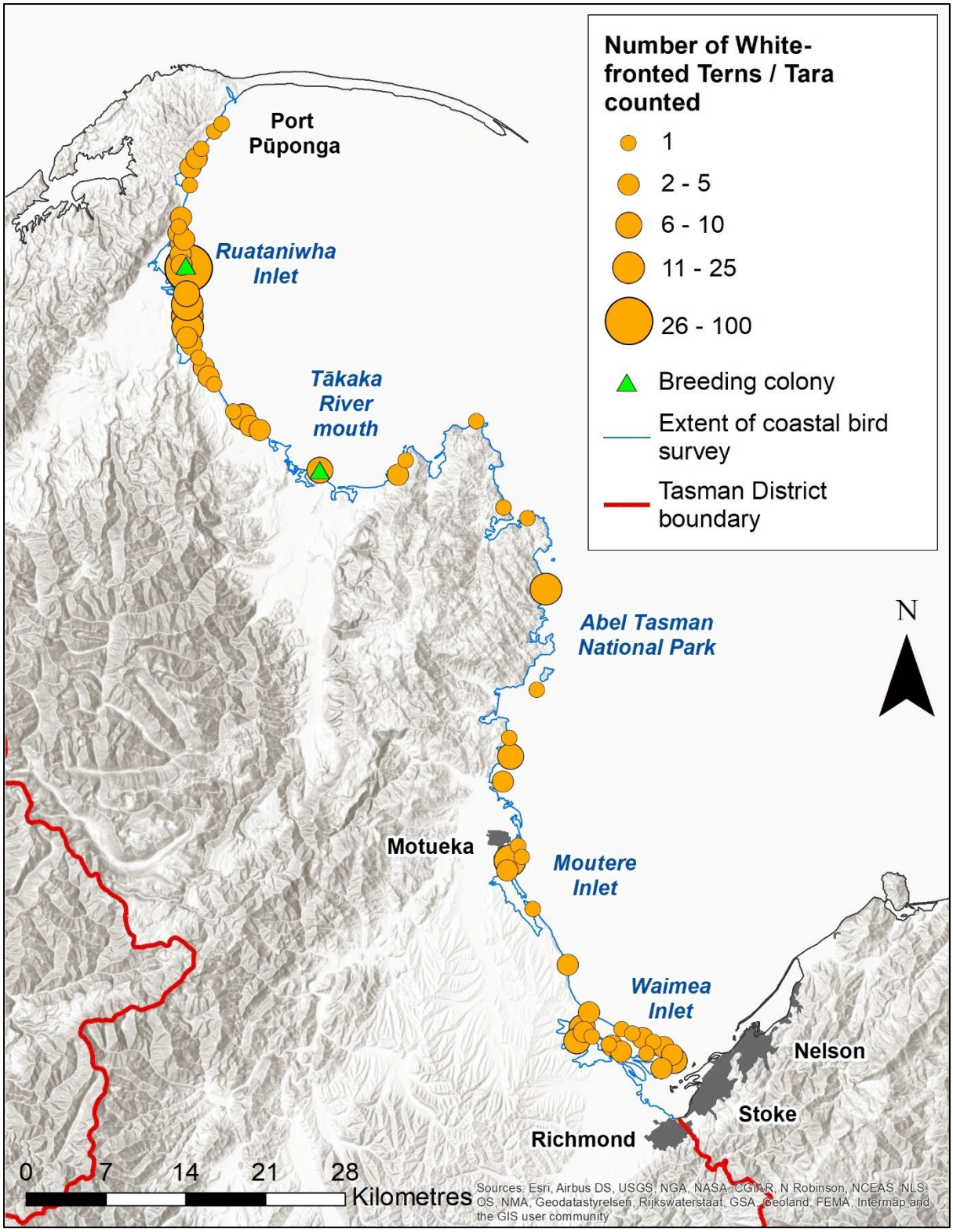

Figure 3.23: Distribution and relative abundance of White-fronted Terns / Tara along the Tasman District coastline.

3.2.19 Observations of some non-target bird species

In addition to the bird species listed in the previous sections, a number of observations of rare or cryptic wetland bird species, or species that are vagrant to New Zealand were made during this coastal bird survey. Wetland bird species were not target species for this survey, as due to their cryptic nature more specialised and resource-intensive survey techniques such as using call playback are required to gain an accurate picture of the numbers and distribution of these species. Bird species that are vagrant to New Zealand were also not target species for this survey, because these species are naturally transitory and therefore not typically a focus for conservation management activities or outcome monitoring. That said, given scarcity of these species along the Tasman District coastline, the following observations may be of interest.

Fernbirds / Mātātā (*Bowdleria punctata*) are scarce but widely distributed in coastal wetlands in the Tasman District, with strongholds in Abel Tasman National Park and on Farewell Spit (Hutzler 2015; eBird 2022). We recorded Fernbirds / Mātātā at two locations during this survey, four birds were encountered on the eastern shoreline of Wainui Bay, near the northern end of Abel Tasman National Park, and another three birds were encountered at the head of Otūwhero Inlet, near Mārahau (Figure 3.25).

Banded Rails / Moho Pererū (*Gallirallus philippensis*) are scarce and sparsely distributed in coastal wetlands in the Tasman District, with hotspots of occurrence in the vicinity of Rough Island in Waimea Inlet, in coastal wetlands near Kaiteriteri and Mārahau and along the coastline of Abel Tasman National Park (Hutzler 2015; eBird 2022). We recorded only one Banded Rail / Moho Pererū during this survey, on the foreshore near Kaiteriteri (Figure 3.25).

Three further wetland bird species, namely Australasian Bittern / Matuku Hūrepo (*Botaurus poiciloptilus*), Marsh Crake / Kotoreke (*Porzana pusilla*) and Spotless Crake / Pūweto (*P. tabuensis*) are sparsely distributed along the Tasman District coastline (eBird 2022) but were not detected during this survey. This is not surprising, as each of these three species spend the majority of their time in dense vegetation and can be difficult to detect. Specialised survey techniques including the use of digital audio recorders or call-playback are typically used to detect and survey these species, so a separate, dedicated survey would be required to gain a detailed understanding of the distribution and abundance of these species along the Tasman District coastline.

Two bird species which are rare visitors to the Tasman District were recorded during this survey. A single Australian Gull-billed Tern (*Gelochelidon macrotarsa*) was recorded in Waimea Inlet, at Rough Island and again at Bell Island (Figure 3.25). Until 2021 the Australian Gull-billed Tern was ranked as a vagrant to New Zealand[4], with a particularly notable influx of birds occurring in 2011 (Miskelly *et al.* 2013). In December 2019, a pair of birds attending a nest containing three eggs was found in Awarua Bay near Invercargill, which is first time that this species has been recorded breeding in New Zealand (Miskelly *et al.* 2021). On the strength of this observation, the Australian Gull-billed Tern has subsequently been re-assessed as a coloniser under the New Zealand Threat Classification System (Robertson *et al.* 2021).

At the same time that this survey was being carried out, a single Little Egret (*Egretta garzetta*) was photographed at Rough Island by Peter and Charmaine Field (Field & Field 2020; Figure 3.24). Little

[4] Under the New Zealand Threat Classification System, a vagrant is defined as a taxon "whose occurrences, though natural, are sporadic and typically transitory, or migrants with fewer than 15 individuals visiting Aotearoa New Zealand per annum" (Townsend *et al.* 2008; Robertson *et al.* 2021).

Egrets are ranked as a vagrant to New Zealand with up to five birds visiting New Zealand each year (Miskelly *et al.* 2019) and a single Little Egret has been recorded at Rough Island on several occasions during 2003-2004 and again during 2019-2020 (eBird 2022).

Figure 3.24: Photograph of the Little Egret that was present at Rough Island, Waimea Inlet in December 2020. Image credit: Peter and Charmaine Field / Macaulay Library ML 287823061.

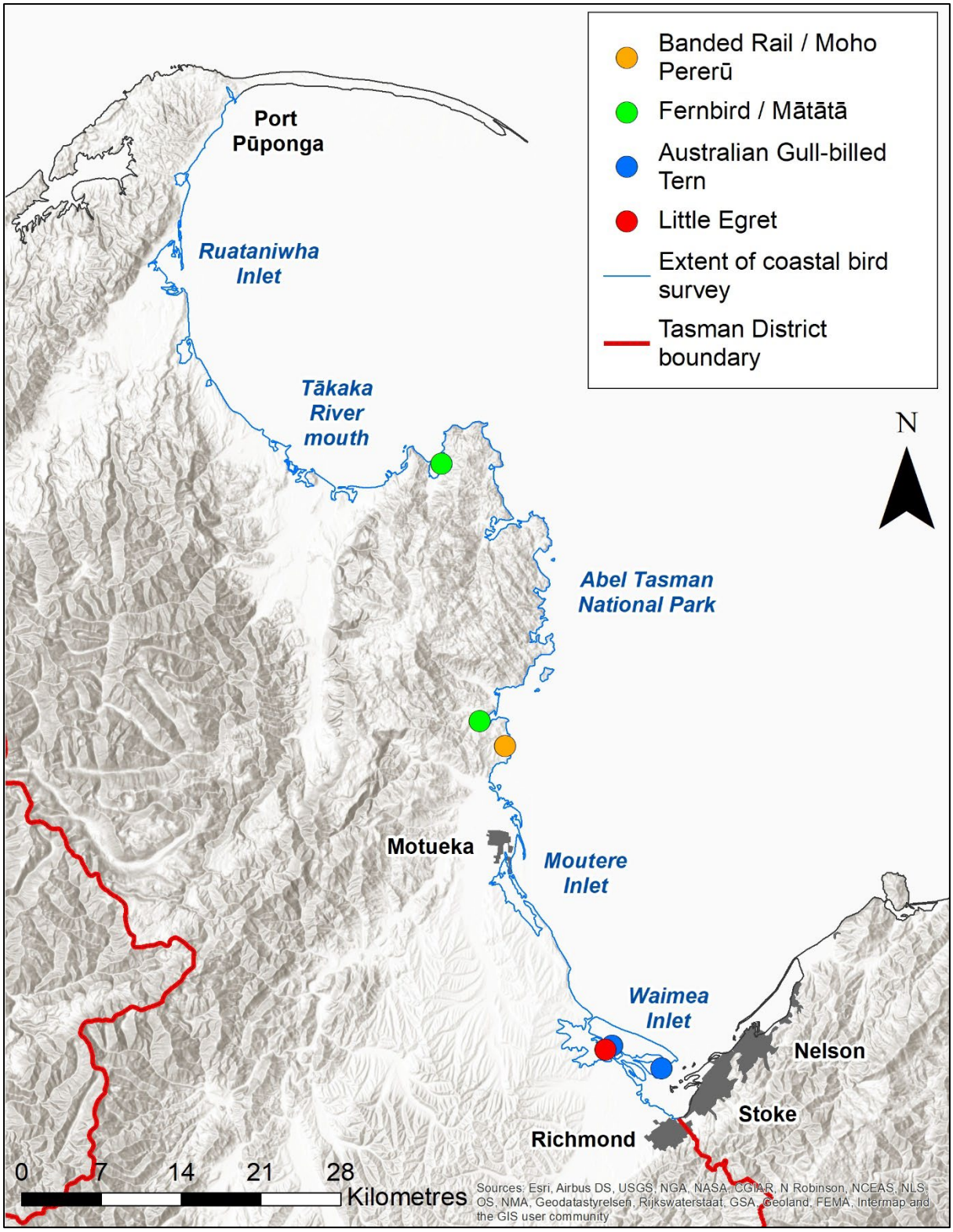

Figure 3.25: Distribution of observations of several non-target and vagrant bird species recorded along the Tasman District coastline in December 2020.

4. Discussion

4.1 Identification and mapping of sites with "important natural ecosystem values"

Schedule 25D of the Tasman Resource Management Plan (TRMP) lists 22 sites in the Tasman District coastal marine area that have been identified as having "nationally or Internationally important natural ecosystem values" and provides a description of the natural values of each of these sites (TDC 2001). It has been over 25 years since these sites were identified and their values summarised, so the completion of this first systematic survey of the summer avifauna values of the Tasman District coastline presents TDC with an opportunity to revise and update its list of coastal sites with important natural ecosystem values, by using this dataset to apply known avifauna values to a set of criteria designed to identify sites with important ecosystem values, and to update the values descriptions of the sites identified.

In recent years, ecological criteria have been used by a number of regional authorities in New Zealand to identify areas of significant indigenous vegetation and significant habitats of indigenous fauna using a standardised and evidence-based process. For example, Greater Wellington Regional Council has developed criteria to identify avifauna values that meet significance thresholds for ecological rarity, diversity and ecological context which have been used to identify a network of 51 coastal and freshwater habitats of significance for indigenous birds in the Wellington region (GWRC 2015; McArthur 2020; Appendix Two). Such criteria will likely need to be region-specific, given biogeographic differences between regions, but the avifauna criteria developed by Greater Wellington Regional Council may make a useful starting point for the development of a set of criteria that are fit-for-purpose for the Tasman District.

The results of this survey make clear that the Tasman District coastline includes sites that provide habitat for internationally, nationally and regionally significant populations of indigenous birds, including those of nationally and regionally threatened species. Many of these sites already fall entirely within sites listed in Schedule 25D of the TRMP, but the summaries of the known values of these sites don't always accurately describe their current avifauna values. For example, the summary of values for the Ruataniwha Inlet site makes no mention of the fact that the shellbank near the mouth of the Ruataniwha Inlet provides breeding habitat for regionally-significant numbers of gulls and terns, with 50% of the regional breeding population of Red-billed Gulls / Tarāpunga and 90% of the regional breeding population of White-fronted Terns / Tara found to be nesting on this shellbank during our survey. Similarly, the summary of values for the Abel Tasman National Park coastline omits to mention that this stretch of coastline provides nesting and roosting habitat for internationally-significant numbers of Spotted Shags / Kawau Tikitiki, with a minimum of 3% of the global breeding population of this species recorded along this stretch of coastline during this survey.

To ensure that the sites of "important natural ecosystem value" listed in Schedule 25D of the TRMP include all of the existing significant coastal habitats for indigenous birds in the Tasman District, we recommend that TDC carries out a re-assessment of coastal sites for inclusion in Schedule 25D by developing a set of avifauna "significance" criteria that can be applied to available coastal bird survey datasets to identify coastal sites that support internationally, nationally and regionally significant populations or communities of indigenous birds. The avifauna data used in this review can also be used to create concise and up-to-date descriptions of the avifauna values of each site identified in the review (including those sites that have already been identified), and these descriptions can then be

used to develop suitable policies and rules governing the appropriate use of these areas; to inform assessments of environmental effects of activities requiring resource consents, and to develop appropriate resource consent conditions. We suggest that the process and criteria used by Greater Wellington Regional Council to identify "significant habitats for indigenous birds" in the Wellington region would make a useful starting point for conducting a similar review of coastal sites with "important natural ecosystem values" in the Tasman District.

4.2 Improving regional oiled wildlife response preparedness

The data collected during this regional coastal bird survey provide the most comprehensive and detailed 'snapshot' of the summer indigenous bird values of the Tasman District coastline ever assembled. In addition to collecting these bird data, our field surveyors also mapped spatial patterns in the abundance of New Zealand Fur Seals / Kekeno (*Arctocephalus forsteri*), the only marine mammal species that was detected during the survey (Appendix Three).

This survey has shown that the diversity of indigenous bird species tends to be highest the sandy beaches and inlets of Golden Bay / Mohua between Port Pūponga and Wainui Bay, whereas lower than average numbers of native species were recorded along much of the rocky coastline of Abel Tasman National Park. This spatial pattern was rather similar in Tasman Bay / Te Tai-o-Aorere, with higher than average numbers of native bird species encountered along sections of coastline with wide sandy beaches and/or large areas of intertidal habitat and lower numbers of native birds along sections of coastline with comparatively little suitable shorebird habitat above the high tide mark and much smaller areas of intertidal habitat. In Waimea Inlet, high numbers of native bird species were encountered along the Richmond foreshore, along the western and southern shorelines of Rabbit Island, at the Bell Island Shellbank and Waimea River mouth, and along the Mapua foreshore.

This survey has also identified a small network of coastal sites that supports relatively large proportions of the regional populations on a number of Nationally Threatened and At Risk species. For example, the shellbank at the entrance to Ruataniwha Inlet near Collingwood was found to support 50% of the regional breeding population of Red-billed Gulls / Tarāpunga and 90% of the regional breeding population of White-fronted Terns / Tara. A series of shellbanks at Rototai, near the Motupipi River mouth was found to support almost 100% of the regional coastal breeding population of Black-billed Gulls / Tarāpuka, 50% of the regional breeding population of Red-billed Gulls / Tarāpunga, 50% of the regional breeding population of Caspian Terns / Taranui and 10% of the regional breeding population of White-fronted Terns / Tara. The coastline of Abel Tasman National Park was found to support a minimum of 3% of the global population of Spotted Shags / Kawau Tikitiki, and almost the entire regional population of Reef Herons / Matuku Moana. The Motueka Sandspit, in addition to being a high-tide roost sites for internationally important numbers of Bar-tailed Godwits / Kuaka and regionally significant numbers of Red Knots / Huahou and Ruddy Turnstones also supported 50% of the regional breeding population of Banded Dotterel / Pohowera. A shellbank adjacent to Bell Island in Waimea Inlet is also a regionally-significant high-tide roost for Arctic-breeding migrants and supports 50% of the regional breeding population of Caspian Terns / Taranui. These results suggest that these high value sites should be considered high priority sites at which efforts and resources to control, contain or manage the impacts of an oil spill should be deployed. By using these sites as a means of prioritising an oiled wildlife response, resources will quickly be targeted towards avoiding, minimising or mitigating the adverse impacts of an oil spill on significant populations of the Tasman

District's most highly threatened coastal bird species, and at sites that support a relatively high diversity of indigenous bird species.

By measuring spatial patterns in the abundance of coastal bird species along the Tasman District coastline, this survey also serves as a comprehensive baseline survey against which future changes in local or regional indigenous bird values can be measured. As a result, as well as creating the opportunity to optimise the deployment of resources during an oiled wildlife incident response, this dataset also creates the opportunity to measure the adverse impacts of future oil spills that occur in the Tasman District coastal marine area, and the success or otherwise of any efforts to control, contain or manage the impacts of these incidents. For this reason, we recommend that this Tasman District coastal bird survey be repeated at five-yearly intervals, to improve TDC and Maritime New Zealand's (MNZ) ability to differentiate other temporal changes in the Tasman District's coastal bird populations from the impacts of marine oil spill incidents and subsequent oiled wildlife response efforts. We therefore recommend that the next Tasman District coastal bird survey be scheduled to be carried out during the summer of 2025/2026.

4.3 Reassessment of regional threat rankings of selected coastal bird species

The New Zealand Threat Classification System provides a tool for assigning a national threat status to individual species, reflecting our knowledge of each species' population size and trends and helping to inform interventions to identify and remedy factors causing population declines (Townsend *et al.* 2008; Crisp 2020). Regional Councils and unitary authorities have statutory obligations to manage the habitats of threatened species within their regions under the Resource Management Act (1991). Until recently, these agencies have used national threat rankings to inform policies, rules and management actions designed to meet these obligations. In many cases however, the regional threat status of a species can differ significantly from the species' national status, so in recent years a number of regional councils have been working with the Department of Conservation to create a methodology within the New Zealand Threat Classification System for assigning regional threat rankings to species, to better inform local efforts to maintain the habitats of species threatened at the regional, as well as national scale (Crisp 2020). Although regional threat rankings have not yet been developed for the Tasman District's bird species, the results of this survey have enabled us to assess the regional threat status of 18 indigenous bird species present in the Tasman District that are either entirely or partly restricted to coastal habitats in the region. These proposed rankings demonstrate that TDC likely has access to a sufficient quantity of bird survey data and expert local knowledge to carry out a full assessment of the regional threat rankings for the Tasman District's birds. We recommend that TDC investigates carrying out a full assessment of the regional threat rankings of the Tasman District's birds using the methodology described in Crisp (2020). We further recommend that TDC engages with Nelson City Council to investigate the relative merits of carrying out an assessment of the regional threat status of birds in the combined Nelson-Tasman region, versus conducting separate reviews for the Tasman District and Nelson City.

Of the 18 coastal bird species for which we have assessed regional threat rankings in this report, 16 of these (89%) have been assigned the new "Climate Impacts" qualifier recently added to the New Zealand Threat Classification System by Rolfe *et al.* (2021). This new qualifier is designed to identify taxa that are, or are predicted to be, adversely affected by long-term climate trends and/or extreme climatic events, including extended periods of abnormal rainfall or sunshine hours, short-duration extreme weather events, and gradual changes to sea level and average temperatures. Adverse effects

of climate change on individual taxa may be direct (e.g., the impacts of extreme weather on populations) or indirect (e.g., increased impacts of predators that have benefitted from climate-change induced environmental changes) (Rolfe *et al.* 2021).

The assignment of the Climate Impact qualifier to a taxon indicates a need for more in-depth research, ongoing monitoring of climate impacts, and potentially a climate change adaptation plan for the taxon (Rolfe *et al.* 2021). The fact that 89% of the taxa re-assessed here have been assigned this qualifier highlights the high degree of vulnerability that the majority of the Tasman District's indigenous coastal bird species have to the impacts of climate change. For example, the Intergovernmental Panel on Climate Change Fifth Assessment Report estimates that global mean sea levels will rise by up to 0.98 m above current levels by the year 2100, assuming unmitigated growth in carbon emissions over that time (Church *et al.* 2013). However, a more recent survey of climate scientists has estimated that global mean sea levels could rise by up to 1.32 m over the same period (Horton *et al.* 2020). Under these scenarios, the Tasman District coastline is likely to become much more prone to flooding in coming decades due to a substantial and rapid increase in the frequency of extreme storm-tide and skew-surge events which in turn may increase rates of coastal erosion (Stephens *et al.* 2020). These potential future changes to the flooding risk and geomorphology of the Tasman District's coastline pose a substantial long-term risk to the viability of coastal bird populations in the Tasman District due to reductions in productivity (caused by local losses of eggs and chicks to flooding) and local population size (caused by net losses in the total area of available habitat). These future impacts may be sufficiently severe to negate any efforts that have been made in the meantime to reduce the adverse impacts of other threats including mammalian predators, weeds, recreational activities and land-use changes, highlighting an urgent need for TDC to include consideration of climate change impacts on indigenous coastal bird species into all aspects of the future management of the Tasman District coastline and its avifauna values.

4.4 Implementing the Proposed National Policy Statement for Indigenous Biodiversity

Policy 13 of the Proposed National Policy Statement for Indigenous Biodiversity (PNPSIB) requires local government agencies to "identify the possible presence of, and manage, highly-mobile fauna" (MFE 2019). More specifically, the PNPSIB requires each regional council and unitary authority to work with local territorial authorities "to survey and record areas outside Significant Natural Areas where highly mobile fauna have been, or are likely to be, sometimes present" and to "include objectives, policies or methods in their policy statements and plans for managing the adverse effects of subdivision, use and development in highly mobile fauna areas, as necessary to maintain viable populations of highly mobile fauna across their natural range" (MFE 2019).

The PNPSIB does not include a list of taxa that have been defined as "highly mobile fauna", however it does define "highly mobile fauna" as animals that move frequently between environments, either to find food, safe locations, locate mates, or seek out certain climates. This includes animals that undertake movements over a district, regional, national or international scale, and over timeframes spanning a day, weeks or months. This definition includes migratory species that leave their breeding areas to go somewhere else for a range of reasons (e.g., Banded Dotterel / Pohowera; Black-fronted Tern / Tarapiroe, *Chlidonias albostriatus* and Wrybill / Ngutu Pare, *Anarhynchus frontalis*). It also includes species that use the landscape less predictably, including those that cycle around habitat

patches that vary in their suitability and resources over time (e.g., Kākā *Nestor meridionalis* and Australasian Bittern / Matuku Hūrepo (MFE 2019).

The Department of Conservation (DOC) has also initiated a mobile terrestrial threatened species research programme, with the aim of identifying and describing the spatial and temporal scales at which "mobile" species use, or move through, the landscape. Specifically, the purpose of this research programme is to identify significant flyways and habitat networks that need to be managed over the entire lifespan of mobile species, to ensure their persistence (DOC 2020). As part of this programme, DOC has adopted a "mobile species" definition very similar to that used by the PNPSIB. Namely, mobile species are:

> *Species that use the environment at regional and national landscape scales, often moving across rohe, takiwā or territorial authorities' jurisdictions on a seasonal basis to exploit feeding and breeding resources* (DOC 2020).

Furthermore, DOC has developed a list of Nationally Threatened and At Risk[5] bird species that meet their definition of being a "mobile species". This list includes 62 bird taxa, 17 of which have been detected along the Tasman District coastline during this survey, representing 25% of the 67 bird species recorded during this survey. It should be noted however that up to 30 additional species recorded during this survey that are ranked as either nationally At Risk, Not Threatened, Migrant or Vagrant also meet the PNPSIB and DOC mobile species definitions, indicating that up to 55 of the 67 bird species recorded during this survey (82%) should be classified as mobile species under the PNPSIB.

By carrying out the first ever complete and systematic survey of the indigenous bird values of the Tasman District coastline, and in particular by mapping the distribution and abundance of indigenous birds to a 1 km spatial resolution along a large proportion of the Tasman District coastline, TDC has now mapped the summer distribution of up to 55 mobile bird species that occur within the Tasman District coastal marine area. This being the case, TDC has already made substantial progress towards implementing Policy 13 of the PNPSIB, namely to "survey and record areas outside Significant Natural Areas where highly mobile fauna have been, or are likely to be, sometimes present."

4.5 Addressing remaining information gaps in coastal avifauna and marine mammal values

This regional coastal bird survey fills some substantial gaps in our knowledge of spatial patterns in the distribution and abundance of coastal bird species in the Tasman District, particularly those species that are relatively widespread along the coastline and are therefore not comprehensively surveyed during Birds New Zealand's national wader counts. As a result, the completion of this survey represents a major step forward in our understanding of coastal bird distribution abundance in the Tasman District, creating the opportunity for relevant local and central government agencies to make better, evidence-based decisions regarding the sustainable management of the Tasman District's coastline. That said, several minor gaps in our understanding of the wildlife values of the Tasman District coastline do remain, which are listed below. In each case, we provide recommendations for survey efforts that could be undertaken to plug these information gaps however it should be noted

[5] Only those species ranked as nationally At Risk, Declining or At Risk, Recovering, AND have been given the qualifier CD (Conservation Dependent) have been included in this list.

that responsibility for, or opportunities to, carry out this work do not rest with Tasman District Council alone. In some cases, it may be more appropriate for other agencies such as the Department of Conservation or Maritime New Zealand to resource or carry out these follow-up surveys, rather than Tasman District Council. Similarly, these surveys also present opportunities for members of the Birds New Zealand or local community-led conservation groups to undertake additional bird survey and research work aimed at improving the management of coastal habitats for indigenous birds.

1. **Population size and trends of Spotted Shags / Kawau Tikitiki**

   The Department of Conservation has recently completed a re-assessment of the conservation status of 491 New Zealand bird taxa, and the Spotted Shag / Kawau Tikitiki has been assessed as having experienced the most dramatic deterioration in conservation status since the previous assessment carried out in 2016, having been upgraded from Not Threatened in 2016 to Nationally Vulnerable in 2021 (Robertson *et al.* 2021). This re-assessment has been based on evidence of recent and ongoing declines in the breeding populations on Banks Peninsula and in Wellington Harbour and the Hauraki Gulf. A substantial decline in the Banks Peninsula population since 2010 is of particular concern, due to the fact that the peninsula is estimated to support between 30% and 50% of the national (and global) population (Robertson *et al.* 2021).

   In the Tasman District, numbers of Spotted Shags / Kawau Tikitiki may also be in decline. Counts of the number of Spotted Shags / Kawau Tikitiki roosting at Tata Beach have declined by approximately 83% between 2009 and 2018, which may indicate either a substantial population decline, or a change in local habitat use (Schuckard & Melville 2019). The New Zealand Threat Classification System Birds Assessment Panel currently estimates the national population to be around 30,000 mature birds (https://nztcs.org.nz/assessments/118704 ; accessed 25/01/2022). This being the case, the 860 Spotted Shags / Kawau Tikitiki counted along the Tasman District coastline during this survey represents at a minimum 2.8% of the national population of this species. It should be noted however that this is likely to be a substantial underestimate of the true population size of this species in the Tasman District, due to the fact that a large proportion of birds are likely to have been foraging out at sea at the time these surveys were conducted.

   To gain a much more accurate and precise estimate of the number of Spotted Shags / Kawau Tikitiki breeding along the Tasman District coastline, we recommend that a boat survey of the Abel Tasman National Park breeding colonies should be carried out during August-October to count the number of occupied nests within each colony at the time of year of peak occupancy. We recommend that this survey be considered a particularly high priority given the substantial deterioration that has occurred to the national threat status of this species since 2016, and the evidence we have of a possible recent decline in the Tasman District breeding population.

2. **Population size and trends of Nationally Threatened or At Risk gull and tern species**

   Our estimates of the breeding population sizes of four species of gulls and terns are likely to be underestimates of the true size of local breeding populations, due to the fact that our survey was carried out a month or so after peak incubation for each of these species. The number of adults, chicks, fledglings and nests counted at the nesting colonies of Red-billed

Gulls / Tarāpunga, Black-billed Gulls / Tarāpuka, Caspian Terns / Taranui and White-fronted Terns / Tara are almost certain to be an underestimate of the size and productivity of these colonies due to the fact that it was apparent that many nests had already hatched, and a number of chicks had already successfully fledged from these colonies by the time that this survey was carried out. Ideally, any breeding population estimate for these highly mobile and colonial nesters should be based on a count of the number of occupied nests during peak incubation. To gain a more accurate and precise estimate of the breeding population sizes and trends of each of these four species, the majority of which appear to be in decline either nationally and/or regionally, we recommend that an annual survey of known colonies in the Tasman District should be carried out during the month of November to count the number of occupied nests in any colonies located.

3. Population size and trends of NZ Fur Seals / Kekeno

This regional coastal survey has mapped the summer distribution and abundance of NZ Fur Seals / Kekeno along the Tasman District coastline (Appendix Three), at a time of year when occupancy rates at local rookeries would have been relatively high (Bradshaw *et al.* 1999). Counts carried out at seal rookeries are known to provide the best data for consistent estimates of population size, however because adult occupancy rates at rookeries can vary substantially from day to day, counts of the number of pups present at rookeries provide the best measure of population size, trend and population productivity (Shaughnessy *et al.* 1994). During the survey reported here, our fieldworkers recorded only total counts of seals encountered per 1 km of coastline and did not record separate counts of the number of seal pups encountered. During future surveys therefore, we recommend that a separate count of the number of seal pups be kept, to provide the most consistent measures of fur seal population size and productivity along the Tasman District coastline. Further to this, non-breeding and post-breeding seals are also known to congregate at non-breeding sites ('haul-outs'), which can be situated at different locations along the coastline to rookeries, and peak occupancy at these haul-outs occurs in July-August (Crawley & Wilson 1976). To adequately map the spatial distribution in seal abundance during the non-breeding season, we recommend that a regional winter survey of NZ Fur Seal / Kekeno distribution and abundance be carried out, during the same years that the (summer) regional coastal bird survey is carried out. Given that we recommend that the next Tasman District coastal bird survey be carried out during the summer of 2025/2026, we recommend that a regional winter survey of NZ Fur Seal / Kekeno distribution and abundance be scheduled to be carried out in July-August 2026. Should it not be feasible to carry out a winter NZ Fur Seal / Kekeno survey along the entire Tasman District coastline, sections of coastline with relatively high NZ Fur Seal / Kekeno winter occupancy probabilities could be mapped using pre-existing data sources and these sections of coastline could be targeted as a matter of priority.

5. Summary of Recommendations

In this section we provide a summary of the recommendations that we have made in the preceding sections of this report. We have divided this summary into two sections, the first section deals with recommended actions for Tasman District Council to undertake, whereas the second section deals with recommendations that may be more appropriate to be actioned by other groups or agencies, such as the Department of Conservation, Maritime New Zealand, Birds New Zealand or other local community-led conservation groups.

5.1 Recommended actions for Tasman District Council

Based on the results described in this report, we recommend:

- That TDC carries out a re-assessment of its coastal sites of "important natural ecosystem values", to ensure that the network of sites includes all coastal habitats within the Tasman District coastal marine area that are known to support internationally, nationally and regionally significant populations or communities of indigenous birds, and to ensure that descriptions of the ecological values of each site are updated. Such a re-assessment should include the development of a standard set of "significance" criteria that can be applied to this coastal bird survey dataset and other available avifauna datasets to identify sites that qualify to be identified as sites with "important natural ecosystem values".

- That TDC carries out a full assessment of the regional New Zealand Threat Classification System rankings of the Tasman District's birds. Such an assessment would involve convening a small panel of ornithologists that possess excellent knowledge of local bird populations in the Tasman District and at least one panel member with expert knowledge of the NZTCS and its processes and criteria. This panel would then hold a 2-3 day workshop reviewing existing data and local knowledge of the size and trends of local bird populations and applying this knowledge to the NZTCS criteria in order to assign a regional threat ranking to each bird species known to occur in the Tasman District. Prior to holding this workshop, consideration should first be given to whether TDC should collaborate with Nelson City Council to carry out an assessment of the NZTCS rankings for the combined Nelson-Tasman region, rather than conducting separate assessments for both the Tasman District and Nelson City.

- That TDC repeats the coastal survey summarised in this report once every five years, to maintain an up-to-date understanding of the distribution and abundance of indigenous bird along the Tasman District coastline; to monitor populations trends and changes in bird distribution; to measure the outcomes of measures taken to manage and protect coastal habitats for indigenous birds; to provide data contributing to the implementation of the PNPSIB and NZTCS and to maintain an accurate baseline measure of indigenous bird distribution and abundance against which the impacts of oiled wildlife events and the effectiveness of any response can be accurately measured. We recommend that the next Tasman District coastal bird survey be programmed for the summer of 2025-2026.

- That during future regional coastal bird surveys, TDC records separate counts of adult NZ Fur Seals / Kekeno and pups be made within each 1 km section of coastline surveyed, to provide the most consistent measure of NZ Fur Seal / Kekeno population size and productivity.

5.2 Recommended actions for partner groups and agencies

Based on the results described in this report, we have identified the following actions that could be undertaken by partner agencies and groups to further improve our knowledge of the indigenous avifauna values of the Tasman District coastline:

- We recommend that a programme of annual counts of occupied nests at known Spotted Shag / Kawau Tikitiki, Red-billed Gull / Tarāpunga, Black-billed Gull / Tarāpuka, Caspian Tern / Taranui and White-fronted Tern / Tara colony sites within the Tasman District be carried out, to improve our knowledge of the breeding population size and trends of these key threatened and/or declining coastal bird species. It is recommended that known Spotted Shag / Kawau Tikitiki colonies be surveyed between August and October each year, and that known gull and tern colonies be surveyed during the month of November each year.

- We recommend that a winter survey for NZ Fur Seals / Kekeno be carried out along the Tasman District coastline, during the same years in which (summer) regional coastal bird surveys are carried out. Given that we recommend that the next regional coastal bird survey be carried out during the summer of 2025/2026, we recommend the first regional winter NZ Fur Seal / Kekeno survey be carried out in July-August 2026.

Acknowledgements

This project was initiated by Trevor James, Senior Resource Scientist, Freshwater & Estuarine Ecology at Tasman District Council. We would like to thank Willie Cook for his assistance with fieldwork and Vicky Melville for her generous hospitality. We are also grateful to Stewart Robertson and Ivan Rogers from the Department of Conservation for their logistical support, and to Abel Tasman Aqua Taxis for providing boat transport along the Abel Tasman National Park coastline. Finally, a big thank you to Rebecca Lunt, Trevor James and Matt Moss for reviewing earlier versions of this report.

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Appendix One

The following table contains a list of all the bird species encountered during this Tasman District coastal bird survey. Species names and taxonomic order are those listed in Checklist Committee (OSNZ) (2010), with additional Māori names sourced from the Māori Dictionary Project (https://maoridictionary.co.nz/). National threat rankings are those listed in Robertson *et al.* (2021) and IUCN threat rankings have been sourced from https://www.iucnredlist.org/ (Accessed 20/07/2021).

Māori name	Common name	Scientific name	National NZTCS ranking	IUCN threat ranking	Total number of individuals counted	Number (and percentage) of survey checklists in which species was observed
Koera	California Quail	*Callipepla californica*	Introduced and Naturalised	Least Concern	71	42 (13.3%)
Pīkau	Peafowl	*Pavo cristatus*	Introduced and Naturalised	Least Concern	2	1 (0.3%)
Kakīānau	Black Swan	*Cygnus atratus*	Not Threatened	Least Concern	549	18 (5.7%)
Kuihi	Canada Goose	*Branta canadensis*	Introduced and Naturalised	Least Concern	8	2 (0.6%)
Pūtangitangi	Paradise Shelduck	*Tadorna variegata*	Not Threatened	Least Concern	388	36 (11.4%)
Tētē Moroiti	Grey Teal	*Anas gracilis*	Not Threatened	Least Concern	173	16 (5.1%)

Māori name	Common name	Scientific name	National NZTCS ranking	IUCN threat ranking	Total number of individuals counted	Number (and percentage) of survey checklists in which species was observed
Rakiraki	Mallard	*Anas platyrhynchos*	Introduced and Naturalised	Least Concern	570	83 (26.3%)
Pārera	Grey Duck	*Anas superciliosa*	Nationally Critical	Least Concern	29	5 (1.6%)
Kuruwhengi	Australasian Shoveler	*Anas rhynchotis*	Not Threatened	Least Concern	5	3 (1.0%)
Pāpango	New Zealand Scaup	*Aythya novaeseelandiae*	Not Threatened	Least Concern	62	3 (1.0%)
Kororā	Little Penguin	*Eudyptula minor*	At Risk, Declining	Least Concern	9	6 (1.9%)
Pakahā	Fluttering Shearwater	*Puffinus gavia*	At Risk, Relict	Least Concern	555	13 (4.1%)
Tākupu	Australasian Gannet	*Morus serrator*	Not Threatened	Least Concern	125	59 (18.7%)
Kawau Paka	Little Shag	*Phalacrocorax melanoleucos*	At Risk, Relict	Least Concern	119	65 (20.6%)
Kawau	Black Shag	*Phalacrocorax carbo*	At Risk, Relict	Least Concern	37	24 (7.6%)
Kāruhiruhi	Pied Shag	*Phalacrocorax varius*	At Risk, Recovering	Least Concern	362	98 (31.1%)

Māori name	Common name	Scientific name	National NZTCS ranking	IUCN threat ranking	Total number of individuals counted	Number (and percentage) of survey checklists in which species was observed
Kawau Tūī	Little Black Shag	*Phalacrocorax sulcirostris*	At Risk, Naturally Uncommon	Least Concern	24	6 (1.9%)
Kawau Tikitiki	Spotted Shag	*Stictocarbo punctatus*	Nationally Vulnerable	Least Concern	860	56 (17.8%)
Matuku Moana	White-faced Heron	*Egretta novaehollandiae*	Not Threatened	Least Concern	561	125 (39.7%)
Matuku Moana	Reef Heron	*Egretta sacra*	Nationally Endangered	Least Concern	12	8 (2.5%)
Kotuku Ngutupapa	Royal Spoonbill	*Platalea regia*	At Risk, Naturally Uncommon	Least Concern	80	9 (2.9%)
Kāhu	Swamp Harrier	*Circus approximans*	Not Threatened	Least Concern	59	51 (16.2%)
Kārearea	New Zealand Falcon	*Falco novaeseelandiae*	Nationally Increasing	Near Threatened	2	1 (0.3%)
Moho Pererū	Banded Rail	*Gallirallus philippensis*	At Risk, Declining	Least Concern	1	1 (0.3%)
Weka	Weka	*Gallirallus australis*	Not Threatened	Vulnerable	29	20 (6.3%)
Pūkeko	Pukeko	*Porphyrio melanotus*	Not Threatened	Least Concern	144	32 (10.2%)

Māori name	Common name	Scientific name	National NZTCS ranking	IUCN threat ranking	Total number of individuals counted	Number (and percentage) of survey checklists in which species was observed
Huahou	Red Knot	*Calidris canutus*	At Risk, Declining	Near Threatened	600	2 (0.6%)
	Eurasian Whimbrel	*Numenius phaeopus*	Migrant	Least Concern	3	2 (0.6%)
Kuaka	Bar-tailed Godwit	*Limosa lapponica*	At Risk, Declining	Near Threatened	5193	47 (14.9%)
	Ruddy Turnstone	*Arenaria interpres*	Migrant	Least Concern	254	4 (1.3%)
Tōrea Pango	Variable Oystercatcher	*Haematopus unicolor*	At Risk, Recovering	Least Concern	1459	216 (68.6%)
Tōrea	South Island Pied Oystercatcher	*Haematopus finschi*	At Risk, Declining	Least Concern	2356	75 (23.8%)
Poaka	Pied Stilt	*Himantopus himantopus*	Not Threatened	Least Concern	344	46 (14.6%)
Pohowera	Banded Dotterel	*Charadrius bicinctus*	At Risk, Declining	Near Threatened	42	13 (4.1%)
	Black-fronted Dotterel	*Elseyornis melanops*	At Risk, Naturally Uncommon	Least Concern	8	2 (0.6%)
	Spur-winged Plover	*Vanellus miles*	Not Threatened	Least Concern	478	59 (18.7%)
Karoro	Southern Black-backed Gull	*Larus dominicanus*	Not Threatened	Least Concern	2053	209 (66.3%)

Māori name	Common name	Scientific name	National NZTCS ranking	IUCN threat ranking	Total number of individuals counted	Number (and percentage) of survey checklists in which species was observed
Tarāpunga	Red-billed Gull	*Larus novaehollandiae*	At Risk, Declining	Least Concern	1554	144 (45.7%)
Tarāpuka	Black-billed Gull	*Larus bulleri*	At Risk, Declining	Near Threatened	231	19 (6.0%)
	Australian Gull-billed Tern	*Gelochelidon macrotarsa*	Coloniser	Least Concern	2	2 (0.6%)
Taranui	Caspian Tern	*Hydroprogne caspia*	Nationally Vulnerable	Least Concern	232	54 (17.1%)
Tarapirohe	Black-fronted Tern	*Chlidonias albostriatus*	Nationally Endangered	Endangered	3	1 (0.3%)
Tara	White-fronted Tern	*Sterna striata*	At Risk, Declining	Near Threatened	335	62 (19.7%)
	Rock Pigeon	*Columba livia*	Introduced and Naturalised	Least Concern	26	1 (0.3%)
Kererū	New Zealand Pigeon	*Hemiphaga novaeseelandiae*	Not Threatened	Near Threatened	45	25 (7.9%)
Kākā	Kākā	*Nestor meridionalis*	Nationally Vulnerable	Endangered	4	3 (1.0%)
Pīpīwharauroa	Shining Cuckoo	*Chrysococcyx lucidus*	Not Threatened	Least Concern	23	18 (5.7%)

Māori name	Common name	Scientific name	National NZTCS ranking	IUCN threat ranking	Total number of individuals counted	Number (and percentage) of survey checklists in which species was observed
Kōtare	New Zealand Kingfisher	*Todiramphus sanctus*	Not Threatened	Least Concern	122	82 (26.0%)
Riroriro	Grey Warbler	*Gerygone igata*	Not Threatened	Least Concern	93	72 (22.9%)
Korimako	Bellbird	*Anthornis melanura*	Not Threatened	Least Concern	150	86 (27.3%)
Tūī	Tūī	*Prosthemadera novaeseelandiae*	Not Threatened	Least Concern	266	122 (38.7%)
Pīwakawaka	New Zealand Fantail	*Rhipidura fuliginosa*	Not Threatened	Least Concern	118	77 (24.4%)
Kakariwai	South Island Robin	*Petroica australis*	At Risk, Declining	Least Concern	1	1 (0.3%)
	Skylark	*Alauda arvensis*	Introduced and Naturalised	Least Concern	198	94 (29.8%)
Mātātā	Fernbird	*Bowdleria punctata*	At Risk, Declining	Least Concern	7	2 (0.6%)
Tauhou	Silvereye	*Zosterops lateralis*	Not Threatened	Least Concern	357	134 (42.5%)
Warou	Welcome Swallow	*Hirundo neoxena*	Not Threatened	Least Concern	460	162 (51.4%)
Manu Pango	Eurasian Blackbird	*Turdus merula*	Introduced and Naturalised	Least Concern	269	138 (43.8%)

Māori name	Common name	Scientific name	National NZTCS ranking	IUCN threat ranking	Total number of individuals counted	Number (and percentage) of survey checklists in which species was observed
	Song Thrush	*Turdus philomelos*	Introduced and Naturalised	Least Concern	153	95 (30.2%)
Tāringi	Common Starling	*Sturnus vulgaris*	Introduced and Naturalised	Least Concern	583	99 (31.4%)
Tiu	House Sparrow	*Passer domesticus*	Introduced and Naturalised	Least Concern	913	158 (50.2%)
	Dunnock	*Prunella modularis*	Introduced and Naturalised	Least Concern	138	78 (24.8%)
Pahirini	Chaffinch	*Fringilla coelebs*	Introduced and Naturalised	Least Concern	614	197 (62.5%)
	European Greenfinch	*Carduelis chloris*	Introduced and Naturalised	Least Concern	159	63 (20.0%)
	European Goldfinch	*Carduelis carduelis*	Introduced and Naturalised	Least Concern	356	106 (33.7%)
	Common Redpoll	*Carduelis flammea*	Introduced and Naturalised	Least Concern	24	9 (2.9%)

Māori name	Common name	Scientific name	National NZTCS ranking	IUCN threat ranking	Total number of individuals counted	Number (and percentage) of survey checklists in which species was observed
	Yellowhammer	*Emberiza citrinella*	Introduced and Naturalised	Least Concern	138	74 (23.5%)

Appendix Two

This table lists the criteria used by Greater Wellington Regional Council to identify coastal and freshwater habitats of significance for indigenous birds in the Wellington region. A full explanation of how these criteria were developed and applied to available avifauna datasets can be found in McArthur *et al.* (2015) and McArthur (2020).

Policy 23 Criteria	**(b) Rarity**	**(c) Diversity**	**(dii) Ecological Context**
Category 1 site (Meets the RPS Policy 23 criteria)	The site provides habitat for: ≥10% of the regional population of a Nationally Critical species; or ≥15% of the regional population of a Nationally Endangered species; or ≥20% of the regional population of a Nationally Vulnerable species; or ≥25% of the regional population of an At Risk species	Seven or more Nationally Threatened or At Risk species are known to be resident at or regularly using the site	The site provides seasonal or core habitat for ≥67% of the regional population of a protected (but not Nationally Threatened or At Risk) species
Category 2 site (Meets the RPS Policy 23 criteria)	The site provides habitat for 5-25% of the regional population of a Nationally Threatened or At Risk species	Between four and six Nationally Threatened or At Risk species are known to be resident at or regularly using the site	The site provides seasonal or core habitat for 33-66% of the regional population of a protected (but not Nationally Threatened or At Risk) species
Category 3 site (Does not meet the RPS Policy 23 criteria)	The site provides habitat for <5% of the regional population of a Nationally Threatened or At Risk species	Less than four Nationally Threatened or At Risk species known to be resident at or regularly using the site	The site provides seasonal or core habitat for <33% of the regional population of a protected (but not Nationally Threatened or At Risk) species

Notes:

1. The threat rankings for bird species mentioned in this review are those listed in Robertson *et al.* (2017).
2. The term 'protected' refers to any species granted absolute protection under the Wildlife Act (1953).
3. Species were considered 'resident or regularly using' a site if they have been or are likely to be encountered during 50% or more of bird surveys carried out in the appropriate season.
4. Translation criteria categories for Policy 23 criterion (b): Rarity are hierarchical, so that if a site meets the criterion for category one, that takes precedence over category two, and so on. For example, a site that supports 20% of the regional population of a Nationally Endangered species would be placed in category one, but a site supporting 12% of a Nationally Endangered species would be placed in category two.

Appendix Three

The following map shows the distribution and relative abundance of New Zealand Fur Seals / Kekeno encountered along the Tasman District coastline during this December 2020 survey.