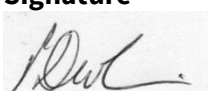


Spotted shag – kōau / pārekareka / kawau tikitiki
(*Phalacrocorax punctatus*)

Threatened species conservation plan

June 2026



Approvals Panel			
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*“Perhaps the most significant deterioration in conservation status recorded in the 2021 assessment process was for spotted shag (*Stictocarbo punctatus*), which has been shifted from Not Threatened to Threatened – Nationally Vulnerable. This change was based on a very significant and ongoing decline in the number of breeding pairs on Banks Peninsula, a site used by c.30-50% of the entire species”*

Department of Conservation, 2021

Figure 1: Adult spotted shag

Introduction

This is a **threatened species conservation plan** for spotted shag (*Phalacrocorax punctatus*) (Figure 1), also commonly known as pārekareka or kawau tikitiki and locally as kōau in the Ngāi Tahu dialect. This species is endemic to Aotearoa-New Zealand and is classified as **‘Threatened – Vulnerable’** by the Department of Conservation (DOC).

The maintenance of indigenous biodiversity is a legal responsibility for district councils (RMA S.31(b)iii & the Council’s Biodiversity Strategy p.6). This plan has been written to assist the Council to meet its statutory obligations to halt the decline of indigenous biodiversity, and to assist with meeting two key goals and their associated objectives as set out in the Council’s Biodiversity Strategy 2008-2035 (Refer also Appendix 1):¹

Goal 1: Conserve and restore indigenous biodiversity in Christchurch and Banks Peninsula.

Objectives

- ✓ Priority internationally, nationally and locally threatened species are protected and restored.
- ✓ Ecosystems, sites and habitats supporting biodiversity are protected and restored.
- ✓ Species and habitats important to Ngāi Tahu are protected, and where appropriate, restored.
- ✓ Plant and animal pests are managed to minimise their impact on biodiversity.

Goal 4: Improve and facilitate research and monitoring of indigenous biodiversity.

Objectives

- ✓ Monitoring programmes for the biodiversity of Christchurch and Banks Peninsula are established, coordinated and maintained.
- ✓ Biodiversity research is supported, coordinated and managed to enable sustainable management of biodiversity
- ✓ The community is involved in biodiversity research and monitoring. Community attitudes to biodiversity are monitored.

Although this species is locally abundant with more than half the entire world’s population living within the Christchurch district, it has undergone a sharp population decline since the 2010-2012 Christchurch earthquakes. This triggers the need to undertake conservation interventions to assist this species to restore its population stability and recover to pre-quake population levels.

¹ Appendix 1 outlines the objectives, implementation targets and implementation actions under goals 1 and 4 that are relevant to conservation actions for spotted shag¹. These provide the mandate for undertaking inventory and monitoring work; threat reduction and predator control; as well as advocacy for the benefit of spotted shags.

The need for a conservation plan

The need for a conservation plan for spotted shag/ kōau has arisen from the species showing a marked decline on Banks Peninsula where Council has a statutory obligation to protect and maintain indigenous biodiversity, especially on the land that it administers. Banks Peninsula supports more than 50% of a global population that has fallen below 10,000 individuals, and because of this situation, the Department of Conservation (DOC) has moved spotted shag to a threat category of 'Threatened – Nationally Vulnerable'. The threats to Spotted Shag around Banks Peninsula need investigation but are suspected to include legacy effects of the 2010-2012 Canterbury earthquakes (which detrimentally impacted two breeding seasons at the time and displaced birds from many colonies); suspected elevated levels of predation on eggs and chicks; recent indications that shags are killed as by-catch in fishing trawler nets; climate change impacts, and reduction in available food resources at sea.

The spotted shag is probably the best example on Banks Peninsula of a conservation need of national and international importance that is largely positioned on CCC land. Other peninsula examples include breeding populations of white-flipped and yellow-eyed penguins, white-fronted terns, variable oystercatchers, and many threatened plant communities, lizard populations and invertebrate communities. The Council is therefore obligated to undertake conservation activities to benefit spotted shag, and by extension, other species dependant on the same habitats.

National and international significance of the local population

Currently, Banks Peninsula supports approximately 50% of the global population of spotted shag/ kōau and is therefore of international significance. Other internationally significant concentrations of avifaunal populations found on the peninsula and within the Christchurch City Council's boundaries include white-flipped penguin (>40% of the World population); New Zealand scaup (>20%); banded dotterel (>20%); wrybill (>10%); variable oystercatcher (>5%) and bar-tailed godwit (>1%). Conservation efforts to protect spotted shag on Banks Peninsula and the wider Christchurch coastline would clearly have global implications for the conservation of this species.

Decline of breeding colonies

Banks Peninsula supports the largest breeding colonies of spotted shag/ kōau in New Zealand with many colonies supporting hundreds of breeding pairs (Refer Appendix 2). Elsewhere in the country most colonies number under 100 pairs. However, the number of internationally important colonies on Banks Peninsula (defined as supporting at least 1% of the total national and world breeding population) has fallen dramatically since 1996 (Appendix 2).

Based on the global population estimate of 30,000 pairs (Taylor 2000), any breeding colony site that supports c.300 pairs or more (= 1% of the population) would meet widely used criterion identifying sites of international importance to the species. In 1996, 30 such colonies were identified (including colonies just below the 300-nest threshold where annual variance could bring them inside). This number fell by more than half to 13 colonies in 2012. It then fell further to five colonies in 2017, to six in 2020, none in 2023 and five in 2024. This sharp reduction in the number (and size) of large colonies further corroborates the finding that the Banks Peninsula spotted shag population has gone into sharp decline and conservation intervention is necessary.

Population falling below 10,000 pairs

One of the main factors leading to the recent classification of the Banks Peninsula coastline as an International Bird Area (IBA) was that it supports >10,000 pairs of Spotted Shag (Gaskin 2015), so a decline below this level should also trigger conservation concern and a review of the species' population trajectory.

Almost all spotted shag breeding and roosting sites on Banks Peninsula nests are located on land administered by the Christchurch City Council

Much of the coastline of Banks Peninsula is unformed legal road (paper road) or other public land, including many cliffs, beaches, narrow headlands, most rock stacks and some islets. These types of land parcels are generally administered by district councils, but on Banks Peninsula there has historically been minimal or no active involvement by Council. Instead, the land is either used by adjacent property owners (mainly farmers), or simply left unoccupied on account of steepness, health & safety risks on unstable cliffs or dense vegetation cover etc. A much smaller extent of this type of coastal land is either privately owned or administered by other agencies such as LINZ or the Department of Conservation.



Figure 2: Examples of the extent of CCC legal road from land behind the cliff edge, down the cliff faces to the mean high-water mark on the Banks Peninsula coastline. Pompey's Pillar (Te Oka Regional Park – left; Goat Point – right). The blue line marks the boundary between private land and the legal road. Base map © CCC WebMap.

New classification as a threatened species

In January 2021, following a coastal bird survey of Banks Peninsula carried out in October 2020, Council's Parks Biodiversity Team made a submission to the Department of Conservation expert panel undertaking the new review of threatened and at-risk bird species in New Zealand. The submission recommended a review of the current status which was supported by survey data collected between 2012 and 2020, providing evidence of population decline and distribution changes on Banks Peninsula. Prior to 2021, the spotted shag had always been classified as "not threatened", based on its previous abundance and no identified conservation issues.

In December 2021, DOC published their new threat classification list (Robertson *et al.* 2021)². This signalled a change of threat status for spotted shag and moved the species up six threat category levels to "Threatened – Nationally Vulnerable".

² <https://www.doc.govt.nz/about-us/science-publications/conservation-publications/nz-threat-classification-system/>

The DOC report also noted:

“Perhaps the most significant deterioration in conservation status recorded in the 2021 assessment process was for spotted shag (Stictocarbo punctatus), which has been shifted from Not Threatened to Threatened – Nationally Vulnerable. This change was based on a very significant and ongoing decline in the number of breeding pairs on Banks Peninsula, a site used by c.30-50% of the entire species (Christchurch City Council, pers. comm.). Breeding habitat was lost during the devastating Canterbury earthquakes 2010-2011, and the population has failed to recover since then. Despite annual variations in breeding effort and the timing in breeding of many coastal shags, ongoing monitoring of smaller populations of spotted shags around the northern North Island and in Wellington Harbour/Port Nicholson have also recorded marked declines in recent decades, so the overall trend is of concern.”



Figure 3: Juvenile spotted shag.

About the spotted shag

The spotted shag/ kōau is endemic to New Zealand and found along much of the northern and eastern coasts of the South Island, parts of the west coast, Stewart Island, and as localised populations in the North Island in Wellington Harbour, Hawke's Bay and the Hauraki Gulf. The national stronghold of the species is the Waitaha Canterbury - Christchurch area where it is one of the most abundant seabirds around the coastline of Banks Peninsula and at sea off Kaitorete Spit and Pegasus Bay.

When not feeding at sea, spotted shags roost and nest on the coastal cliffs, islets and rock stacks of the peninsula, with smaller numbers visiting inlets, estuaries, and the tidal reaches of rivers. Spotted shags do not habitually occur inland.

Spotted shags have no natural indigenous predators on land (other than possibly swamp harrier), but likely fall prey to sea lions, seals and sharks at sea. They also suffer mortality from being accidentally caught and drowning in fishing nets. Until recently, it was assumed that they suffered relatively low predation pressure from introduced mammals because many of the breeding colonies were located on steep marine cliffs and islets. However, this may have changed since the 2010-2012 Christchurch earthquakes as many colonies have relocated to sites deeper within bays and on lower slopes, which are much more accessible to mammalian predators.



Figure 4: Spotted shag colony with nests on ledges atop an impressive build-up of guano

Identification

Spotted shags/ kōau are a slender, long-necked seabird, weighing 700-1200 g and measuring 64-74 cm in length. They have pale bills, yellow feet and greenish facial skin. Plumage changes markedly through the year with juveniles being largely dark greyish above/pale below; non-breeding adults looking similar but with a darker face and neck. Breeding-plumaged adults have a double head crest and black and white head/neck pattern. When in nuptial plumage - immediately before breeding - adults also have white 'filoplumes' on the sides of their heads, rump and thighs. In all plumages, spotted shags have small dark spots on their back and wings – giving the species its name.



Figure 5: Spotted shag juvenile (left), non-breeding adult (centre) & breeding-plumaged adult (right).



Figure 6: Adult spotted shag in nuptial plumage (left). Spotted shags in flight (right).

Ecology

Spotted shags/ kōau are marine birds that feed up to 16 km offshore by day and return to roost on land at night (Szabo 2016). With torpedo-shaped bodies and large-webbed feet, they are adept at diving and catching fish, squid and marine invertebrates underwater. They are highly gregarious, feeding, roosting and breeding in groups. They breed in colonies on cliffs and shoreline slopes, usually between September and November on Banks Peninsula. When not breeding they roost communally around coastlines and feed at sea in flocks, sometimes numbering thousands of birds. During the non-breeding season many spotted shags stay around Banks Peninsula, but large numbers (up to 10,000) move southwards to the Ashburton River mouth from where they feed off the Canterbury Bight (Crossland 2021). Smaller numbers (<2000) move northwards into coastal Pegasus Bay where their main roosts are cliffs and rock stacks on the northwest part of Banks Peninsula as well as sandy beaches at the of the Waimakariri River mouth and Ashley Estuary.



Figure 7: Spotted shag flock feeding at sea off the Banks Peninsula coast.



Figure 8: Enormous feeding flocks involving thousands of birds were a characteristic feature of coastal waters around Banks Peninsula. Until recent years. By 2026, the largest flocks observed seldom exceed 1000 individuals.

Rapid Population Decline

Recent changes in the national & global population

The total New Zealand, and therefore global, population of the spotted shag/ kōau remains unknown. However, prior to the 2010–2012 Canterbury earthquakes, the most reliable estimate was fewer than 30,000 breeding pairs (Taylor 2000). This estimate was based primarily on a 1996 census of Banks Peninsula, which recorded 22,123 nests (equivalent to breeding pairs) (Doherty & Brager 1997), together with estimates of smaller populations elsewhere in New Zealand totalling approximately 7,900 additional pairs. On this basis, Banks Peninsula supported an estimated 74% of the national and global population of the species.

Expressed as individuals, a conservative estimate can be derived by assuming two adults per breeding pair and an average of only two fledged young surviving to breeding age from each pair (from an annual clutch size of three to four eggs over a minimum two-year period prior to recruitment into the breeding population). This approach gives a minimum estimated population of 88,492 individuals in 1996.

By 2024, the Banks Peninsula breeding population had declined to 6,381 nests (breeding pairs), representing only 28.8% of the 1996 breeding population. Using the same conservative assumptions outlined above, this equates to an estimated local population of approximately 25,524 individuals. The true figure may be lower if fledging success and juvenile survival rates have also declined, although these parameters are currently unknown and require investigation.

Based on these estimates, the Banks Peninsula population has declined by approximately 62,968 individuals between 1996 and 2024, representing an extraordinary reduction in abundance. The decline is also reflected in reductions in both the number and size of breeding colonies, together with the reduction in the size of feeding flocks, which have declined from low thousands to only hundreds of birds. Previously large ‘rafts’ of Kōua are no longer observed on regular boat-based coastal surveys, this observation has occurred over the period of 2020 to 2026 (Alison Evans, pers. Comm.).

Table 1. Revised estimate of total New Zealand/World spotted shag population, 2026.

Location	Estimate of pairs/nests	Source
Hauraki Gulf	300	Lovegrove (2017), Evans & Hosking (2019)
Hawkes Bay	10	estimate
Wellington Harbour	55	Waugh <i>et al.</i> 2013
Able Tasman NP	60	Chivers (2014)
Nelson City coast	10	S. Butcher pers. comms.
Marlborough Sounds	1250	Bell (2012)
NE coast South Island	<2000	estimate
Banks Peninsula	6400	CCC 2024 census
Buller	>600	West Coast Penguin Trust
South Canterbury	600	estimate
North Otago	<500	estimate
West Coast	<500	estimate
Fiordland	<200	estimate
Otago Peninsula	2000	Lalas 1993
Stewart Island	<500	estimate
<i>Total population estimate</i>	<i>13,000 – 16,000</i>	

Given the substantial decline in the Banks Peninsula population, the total national — and therefore global — population estimate for spotted shag/ kōau now requires major downward revision. A revised national population assessment is urgently needed and is identified as a key objective of this threatened species conservation plan (see below). In the interim, the best available estimate can be derived from recent census information and regional data from around New Zealand (Table 1), suggesting a total population of approximately 13,000 –16,000 breeding pairs nationwide. The Banks Peninsula population, at approximately 6,400 breeding pairs, now constitutes just under half of the revised global population, with the remaining regions of New Zealand supporting the remainder.

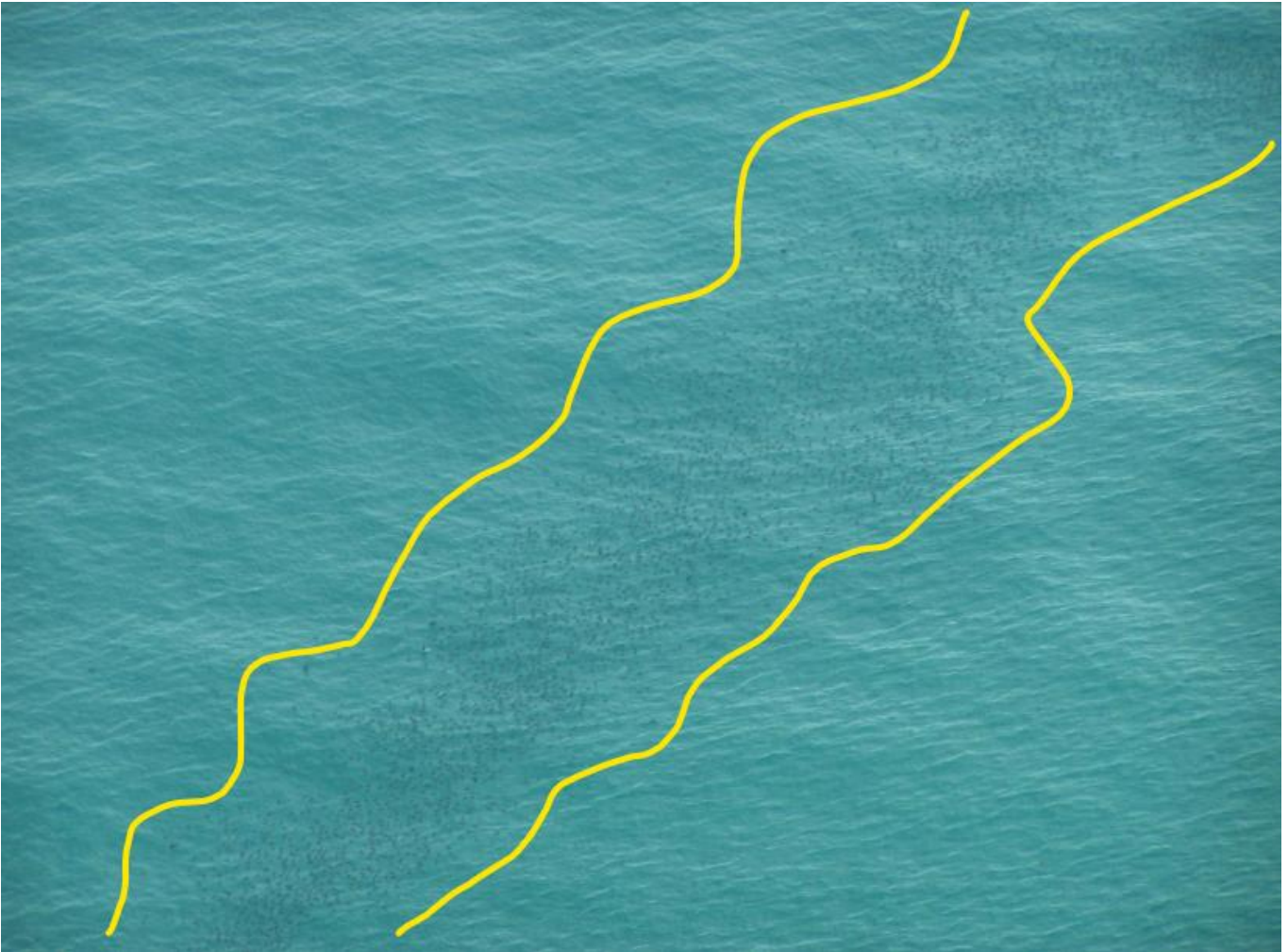


Figure 9: Part of a 3000-strong spotted shag feeding flock off SW Banks Peninsula, in March 2010, prior to the Christchurch earthquakes.

Significance of the local population

Banks Peninsula is recognised as an Important Bird Area (IBA) based on its spotted shag population (Gaskin 2015). Important Bird Areas are designated by the world's leading avian conservation agency, Birdlife International, as critical sites for bird conservation globally. In 2018 the coastline of Banks Peninsula was designated an IBA based on its importance to two trigger species: spotted shag and yellow-eyed penguin (Gaskin 2015). The designation covers c.1430 ha of cliff, islets, stacks and shorelines and was based on the following three IBA criteria:

- ✓ *Criterion A4iii* was triggered because Banks Peninsula at the time of assessment (2013) supported more than 10,000 pairs of spotted shag.
- ✓ *Criterion A4* states that an area can be designated an IBA if “more than threshold numbers of one or more congregatory species occur, including: (A4iii) >10,000 pairs of seabirds.
- ✓ *Criterion A4ii* could also have been triggered: – “>1% of the global population of [a congregatory species of] seabirds. (see below).



Figure 10: Typical spotted shag breeding colony – positioned on ledges part-way up a volcanic cliff-face, directly facing the ocean.

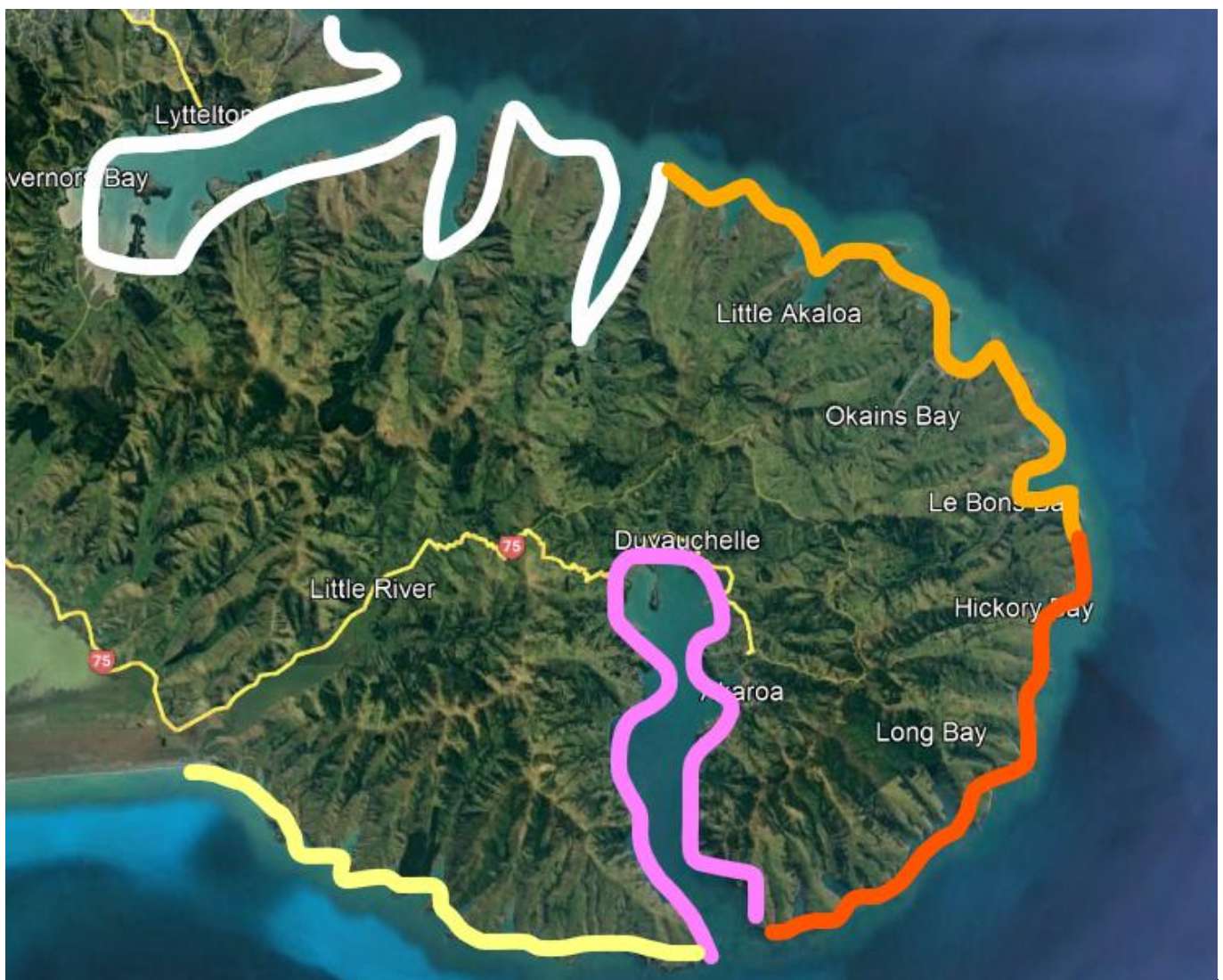
Spotted shag/ kōau population monitoring on Banks Peninsula

Seven breeding season surveys have been completed for spotted shags/ kōau around the full coastline of Banks Peninsula between 1960 and 2024 (Refer Figure 8 and Table 2). They were undertaken over similar dates and utilised closely comparable nest finding and census methodology. Six surveys were undertaken from a boat motoring close to the shoreline, and one count (2012) was undertaken from a helicopter flying slowly just offshore and at a height level with the mid-upper part of the cliffs. Results from these surveys are given in Table 2 (below), and the full census data are provided in Appendix 1.

All surveys were undertaken during the incubation stage of the breeding cycle, with courtship and nest building having finished. A very small proportion of nests were observed containing small chicks, but the vast majority were incubating eggs. The survey results between years were therefore direct comparable.

Table 2: Banks Peninsula spotted shag breeding survey nest totals, 1960 – 2024.

Sector	1960	1996	2012	2017	2020	2023	2024
North-west	1000	2161	592	557	733	688	786
North-east	2137	1901	1207	1407	1304	874	918
South-east	1678	4396	4763	1795	1469	517	529
Akaroa Harbour	96	898	272	468	352	301	449
South-west	4876	12767	4932	4564	4715	812	3699
Total	9787	22123	11766	8791	8573	3192	6381
Dates	26 - 28 Oct (Peninsula) & 26 Nov (Sumner Hd)	24 Oct - 4 Nov	31 Oct - 1 Nov	24 Oct - 5 Nov	23 Oct - 3 Nov	24 Oct - 6 Nov	25 Oct - 7 Nov
Source	Bell (1961); Turbott & Bell (1995)	Doherty & Brager (1997)	Crossland & Crutchley. 2017	Crossland & Crutchley. 2020	Crossland et al. In prep.	Crossland et al. In prep.	Crossland et al. In prep.


Figure 11: Survey sectors of Banks Peninsula, where white = North-West, orange = North-East, red = South-East, pink = Akaroa Harbour, and yellow = South-East (Base map © Google Earth).

Decline of breeding colonies on Banks Peninsula

Following the major earthquakes between 2010 and 2012, there was evidence of multiple recently abandoned colonies. The multiple earthquakes caused extensive cliff failure around the Banks Peninsula coastline (Figure 10), particularly on the northwest, northeast, and southeast sides. Additionally, cliff faces that did not fail were showered with avalanches of rock and loess soil, while the multiple aftershocks were transmitted as strong percussion through the cliff structures, likely possibly damaging nests and shaking eggs, killing the embryos.



Figure 8: Part of the SE coastline of Banks Peninsula, showing earthquake-generated cliff failures.

The greatest absolute decline has occurred in the south-western bays, where the number of nests (equivalent to breeding pairs) fell from 12,767 in 1996 to 3,699 in 2024, representing a 71% reduction. However, proportionately, the decline has been even more severe in the south-eastern bays, known as “the wild side”, where nest numbers declined from 4,396 in 1996 to just 918 in 2024 — a reduction of 88%.

Despite the substantial decline in the south-western bays since 1996, interpretation of longer-term population trends remains uncertain. Excluding the exceptionally high count recorded in 1996 and the unusually low count of 812 pairs in 2023 — a breeding season in which much of the Banks Peninsula spotted shag population apparently abstained from breeding — annual totals recorded between 2013 and 2024 ranged from 3,699 to 4,932 nests (mean = 4,477), which is broadly comparable to the 4,876 nests counted in 1960.

The significance of this similarity is unclear. It may indicate that the population increased markedly through the late twentieth century before declining again to levels similar to those recorded in the 1960s. Alternatively, it is possible that the 1960 census was undertaken during a season in which a substantial proportion of birds abstained from breeding, as documented during both the 2021 and 2023 breeding seasons (A. Crossland, unpublished data), meaning the actual population at that time may have been considerably larger than census totals suggest.

Post-earthquake surveys undertaken since 2012 have also revealed a partial shift in colony distribution patterns. Many large colonies formerly located on tall, ocean-facing cliffs (Figures 9 and 12) have been abandoned, while there has been an increasing tendency for smaller colonies to establish on much lower terrain deeper within embayments (Figures 13 and 14). One likely consequence of this shift is increased vulnerability to predation. The previously occupied oceanic cliff sites were largely inaccessible to mammalian predators, whereas many of the newer colony locations are readily accessible to mustelids, rats, and in some areas also cats, hedgehogs, and possums. Roosting adult birds at these sites are also likely to face a heightened risk of predation.



Figure 10: A typical Spotted Shag colony occupying narrow ledges and lava pockets on a tall cliff face.



Figure 9: Example (1) of spotted shags nesting on a low slope, easily accessible to mammalian predators.



Figure 11: Example (2) of spotted shags nesting on a low slope, easily accessible to mammalian predators.

Sites of importance to spotted shags/ kōau elsewhere in the Christchurch district

Spotted shag/ kōau numbers on the Avon-Heathcote Estuary are generally low, presumably because they prefer feeding grounds out in southern Pegasus Bay and choose to roost on the northwest Banks Peninsula cliffs rather than the estuary shorelines. However, the end of Brooklands Lagoon spit at the Waimakariri River mouth is the favoured roost site for spotted shags feeding further north in Pegasus Bay. At peak times, upwards of 500 spotted shags roost there, making the site both nationally and internationally important for the species.

Table3: Numbers of spotted shag roosting at Waimakariri River mouth, 2020.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
560	116	236	514	726	680	17	7	4	54	125	671



Figure 16: Spotted shag roost at the tip of Brooklands spit, January 2022.



Figure 17: This swimming raft at Akaroa doubles on a cold winter's day as a safe roosting site for a mixed group of spotted shags, little black cormorants and a lone pied cormorant. This is a good example of how provision of roosting opportunities for shags and roosting/nesting opportunities for other coastal birds can amicably accommodate wildlife in close proximity to human activity.



Figure 18: Although almost exclusively a cliff-nesting species, this relatively recent colony established on a derelict wharf at Oamaru and similar colonies on wharves at Timaru Port show that spotted shag will readily nest on derelict structures over water if the opportunity is available. This may offer future options for supporting population recovery around Banks Peninsula.

Conservation goals

This threatened species conservation plan for spotted shag/kōau focuses on research and monitoring to better understand ecological and environmental reasons for the species' recent decline, breeding colony and roost site protection, and the elimination or mitigation of threats including predation, disturbance and mortality because of interaction with fishing nets.

Short term goals

- ✓ To safeguard breeding populations of spotted shag/ kōau on Banks Peninsula.
- ✓ To safeguard post-breeding-winter populations of spotted shags/ kōau along the Greater Christchurch coastline.

Long-term goals

- ✓ To facilitate a reversal in the recent decline in spotted shag/ kōau numbers and restore the proportion of the national and global population of spotted shag living within Banks Peninsula and Greater Christchurch.

Actions

Conservation Research & Monitoring

Until recently spotted shag ecology, population trends and conservation needs were poorly studied. Census work post the Canterbury earthquakes has brought attention to the extent of the sizeable population decline but not the causes. Focused research and more targeted monitoring is now needed to inform an appropriate conservation response to the species status slipping to threatened status.

- ✓ Undertake 3-yearly boat-based or helicopter-based surveys from 2026 onwards around the full coastline of Banks Peninsula, including harbours and bays. Replicate methodology used in previous surveys. Work closely and share resources with the Department of Conservation to achieve this. **Very High Priority**
- ✓ Collaborate with DOC to undertake Banks Peninsula spotted shag surveys as part of a national census co-ordinated with Birds NZ and other partner organisations. Take a collaborative role in partnering with other agencies and parties to conducting future national surveys of spotted shag breeding populations. **Very High Priority**
- ✓ Support monitoring of breeding success at selected accessible colonies on different parts of Banks Peninsula every 2-5 years, including chick fledging and survival rates. This should investigate colonies situated on both cliffs and slopes. **High Priority**
- ✓ Support banding and/or GPS tracking studies of spotted shags with the aim of determining longevity, movements, seasonal dispersals/migrations, and site fidelity to colonies and roosts. **High Priority**
- ✓ Support studies on aspects of population dynamics of spotted shags. **Medium Priority**
- ✓ Support studies on dietary requirements and feeding behaviour of spotted shags around Banks Peninsula, as well as investigating why colonies have moved and reduced in size. **High Priority**
- ✓ Support investigations of “at sea” threats to the Banks Peninsula spotted shag population including the impacts of climate/ocean temperature and interactions with commercial fishing. **High Priority**

- ✓ Support nest monitoring to identify mammalian and avian predator species, and obtain measure of predation losses to clutches, nestlings and attendant adults at colonies. **High Priority**
- ✓ Support investigations into predation pressure on islands, rock stacks, vertical oceanic cliffs, smaller cliffs, and slopes/loess banks. **High Priority**

Threat Management

The full suite and relative magnitude of threats to spotted shags/kōau are poorly understood but are thought to include legacy effects of the 2010-2012 Canterbury earthquake sequence (including loss of colonies; displacement and relocation of some nesting activity away from vertical sea cliffs to lower slopes within bays which has increased vulnerability to mammalian predators; climate change impacts; food resource changes; drownings in trawler nets and exposure to avian diseases like H5N1 bird flu and avian malaria.

- ✓ Support nest monitoring to identify mammalian and avian predator species, and obtain measure of predation losses to clutches, nestlings and attendant adults at colonies. **High Priority**
- ✓ Initiate and support mammalian predator control to protect spotted shag colonies within key population areas such as the south-west bays, the Wildside area, Scarborough and Godley Heads. **High Priority**
- ✓ Assess the presence of mammalian predators on islets and rock stacks around the peninsula and support the commencement of control operations at locations where this is required and feasible within five years. **Very High Priority**
- ✓ Support discussions and work with external agencies to limit the incidence of fisheries by-catch of spotted shags. **High Priority**
- ✓ Support discussions and work with external agencies to investigate other issues negatively impacting spotted shags at sea such as poor food resources, pollution and ingestion of plastics; predation, etc. **High Priority**
- ✓ Support discussions and work with external agencies to investigate the impact of climate change on spotted shags – such as requirements to fly further from the peninsula to find food, thermal impacts at breeding colonies, nest parasites, etc. **Medium Priority**
- ✓ Support the rescue and rehabilitation of sick spotted shags washed up on peninsula and city beaches. Note that these were formerly left to die as the species was seen as abundant. But this approach should now change in accordance with the population decline and new threat status of the species. **High Priority**

Habitat Management

The breeding and roosting habitats of spotted shags/kōau are largely on difficult-to-access coastal sites including cliffs, rocky shorelines, islets, rock stacks, and reefs. Some are more accessible like wharves, jetties and beaches. Feeding habitats are all aquatic, both oceanic and coastal. The scope of habitat management options are generally limited to management of human activity in close proximity, weed and animal pest control and response to oil spills, etc.

- ✓ Support active management on some islets, stacks, headlands and certain ecologically important cliff-faces for biodiversity values. **Very High Priority**

- ✓ Work with DOC, Lyttelton Port Company, Runanga and local community groups to provide safe roosting sites for spotted shags in areas around Banks Peninsula where human disturbance may be an issue. Examples are where shags are currently roosting on jetties and wharves utilised for human activity. Rafts and roosting platforms located in safe areas could be considered. **High Priority**
- ✓ Determine the amount of funding and resourcing required to resource habitat condition improvement and eradication of pest animals and plants from islets and stacks, headlands and cliffs. Determine an appropriate time to put forward these habitat enhancements as a priority Long Term Plan candidate project. **High Priority**
- ✓ Develop a programme to control threats from invasive pest plants at spotted shag colonies. **High Priority**
- ✓ Support fencing-off colonies to exclude stock where stock access is found to be an issue. **Medium-High Priority (depending on site)**
- ✓ Install signage and engage in education initiatives with white-baiters, fishers, dogwalkers and the public at the tip of Brooklands spit (Waimakariri River mouth) to protect the large roost of spotted shags there from excessive disturbance. **High Priority**
- ✓ Work with other agencies to prepare for oil spills and assist with event response where appropriate and within the resource availability and staff expertise of Council. **High Priority**
- ✓ Restrict usage of drones from within 200 m of spotted shag colonies. **High Priority**

Local Community engagement

Conduct education and outreach activities to motivate Christchurch communities to want to safeguard this iconic Banks Peninsula species and engender a strong sense of pride that such a high proportion of the world population resides here.

- ✓ Support wider public education on the newly designated threat status of spotted shags, their importance to the coastal ecosystem and the extraordinary fact that Banks Peninsula (and Christchurch District) supports more than half the entire World population. **Very High Priority**
- ✓ Raise the local profile of Banks Peninsula spotted shags and increase community awareness and sense of ownership of the species. Including encouraging community recognition that spotted shag should have special iconic status on Banks Peninsula in the way that penguins, kereru and tui do. **High Priority**
- ✓ Engage with Rūnanga around possible collaboration in kōau/spotted shag research, monitoring and protection of the Banks Peninsula reef heron population. Accommodate Māori cultural knowledge, perspectives and aspirations in the conservation and management of kōau in the Christchurch – Banks peninsula area. **High priority**

Review Date

This Threatened Species Conservation Plan for spotted shag should be reviewed every five years, following the next two peninsula breeding population surveys. The next review should be in mid-2031.

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Appendix 1: Christchurch Biodiversity Strategy targets.

Implementation targets relevant for spotted shag

Goal 1 Objectives	Implementation target	Implementation actions	priority
Objective 1.1: Priority Internationally, nationally and locally threatened species are protected and restored.	Target 1.1.1: Nationally and locally threatened species are identified, prioritised and monitored for conservation.	Action 1: Surveys of Christchurch and Banks Peninsula indigenous plants and animals [including birds] are undertaken.	Very high
	Target 1.1.2: Plans are prepared and implemented for nationally and locally threatened species protection.	Action 1: Conservation plans are prepared for nationally and locally threatened species.	High
		Action 2: Policy and or legal mechanisms are investigated and implemented for threatened species on road verges and other transport corridors.	High
		Action 3: Protection measures are initiated for priority species. See Action 1 above and Targets 1.1.1 and 1.2.1.	Very High
Objective 1.2: Ecosystems, sites and habitats supporting biodiversity are protected and restored.	Target 1.2.1: Ecosystems, sites and habitats with indigenous species on Council and private land are identified, prioritised, protected and restored where appropriate	Action 1: Surveys are undertaken of habitats with indigenous plants, invertebrates, lizards and fish [including birds], with priority given to land environments with <10% indigenous cover.	Very high
		Action 2: An assessment and prioritisation of biodiversity on Council owned or managed land is undertaken.	Very high
		Action 3: Management plan(s) and or other legal mechanisms provide long term protection for priority biodiversity on Council land.	Very high
		Action 4: High priority biodiversity sites are investigated for purchase on Banks Peninsula (including the Port Hills), Kaitōrete Spit and the plains. See Strategy concept plans for initial options.	Very high

		Action 5: Implement protection measures for priority habitats that require physical protection such as fencing on Council land.	Very high
	Target 1.2.3: Management of biodiversity on private land is appropriately supported.	Action 1: Technical advice is made available to landowners. See Target 2.1.1. Action 2.	High
		Action 2: Council provides for rates rebates on land covenanted for biodiversity protection purposes.	Very high
		Action 3: Council provides contestable grants for biodiversity conservation work on private land.	High
		Action 4: Council supports the work of conservation trusts in the covenanting of private land for biodiversity protection.	Very high
		Action 5: Biodiversity technical and site management support is available to landowners on properties containing priority habitat within acutely and chronically threatened land environments. (Subject to Actions 1 and 2, Target 1.2.2)	High
	Target 1.2.4: Connectivity is maintained and established between habitat fragments wherever practicable.	Action 1: Road maintenance policy is developed to protect/ facilitate biodiversity corridors along road verges	High
		Action 2: Identify opportunities for linking biodiversity sites and evaluate proposals in existing strategies and plans.	Medium
	Target 1.2.7: The relative costs and benefits of biodiversity restoration and protection projects are understood, and projects prioritised on a City wide basis.	Action 1: Develop criteria and prioritise biodiversity restoration projects.	Very high
		Action 3: Appropriate mainland island concepts are implemented as appropriate. Depends on result of Action 2 assessment above.	Depends on the findings of the above investigation
	Target 1.2.8: Ecosystem function is improved (including species	Action 2: Implement habitat restoration for priority sites on Council managed land. See Target	Medium

	restoration) to compensate for previous biodiversity losses and enhance remnant indigenous biodiversity	1.2.7 Action 1 and Target 1.2.8 Action 1.	
		Action 3: Council works with Ngāi Tahu on species, habitat and ecosystem recovery programmes...	Very high
Objective 1.3: Species and habitats important to Ngāi Tahu are protected and where appropriate restored.	Target 1.3.1: Council is familiar with the species and habitats important to Ngāi Tahu.	Action 1: Work with Ngāi Tahu to identify and prepare a database of sites and species within Christchurch and Banks Peninsula and establish appropriate systems to protect sensitive information pertaining to sites.	High
Objective 1.4: Plant and animal pests are managed to minimise their impact on po.	Target 1.4.1: Pest management plans, policies and initiatives (internal and external), including for domestic animals on Council managed land, are prepared, contributed to, coordinated and implemented.	Action 1: A Council pest management strategy is developed.	Very high
		Action 3: Control of plant and animal pests is extended, where possible to new Council managed sites with priority on protecting nationally and locally threatened habitats and species.	Very high
		Action 4: Control of plant and animal pests is maintained on priority existing Council managed biodiversity sites with nationally important and or locally threatened habitats and species such as the species on the oxidation ponds.	Very high
Objective 1.5: New Council policy will take account of and be aligned with the goals and objectives of the biodiversity strategy.	Target 1.5.1: Strategies, bylaws and policy decisions will ensure that priority biodiversity is protected and maintained	Action 1: Council policy will take account of indigenous biodiversity priorities.	Very high
	Target 1.5.2: Council capital and operation programmes will ensure the continued protection of priority biodiversity.	Action 1: Biodiversity initiatives will be funded as appropriate in the LTCCP	Very high

Goal 4 Objectives	Implementation target	Implementation actions	priority
Objective 4.1: Monitoring programmes for the biodiversity of Christchurch City are established, coordinated and maintained.	Target 4.1.2: Monitoring programmes enable the viability and trends of priority ecosystems and species to be sufficiently understood to guide management actions.	Action 1: Monitoring programmes are maintained, and initiated where appropriate, to determine ecological change over the long term.	Very high
Objective 4.2: Biodiversity research is supported, facilitated, coordinated and managed to enable sustainable management of biodiversity.	Target 4.2.1: Research programmes enable the viability and trends of priority ecosystems and species to be sufficiently understood to guide management actions	Action 1: Research is undertaken on the maintenance of priority remnant habitats in areas with	High
	Target 4.2.3: Research programmes enable prioritisation of biodiversity protection and management.	Action 1: Biodiversity needs are prioritised and applied to research project objectives.	Very high
Objective 4.4: Community attitudes to biodiversity are monitored.	Target 4.4.1: Monitoring gauges community support and concerns about biodiversity.	Action 1: Resident surveys (formal and informal) are undertaken.	High
		Action 2: Council will engage with iwi, community groups, organisations and trusts to maintain and increase understanding of community attitudes, concerns and initiatives.	Very high

Appendix 2: Spotted shag colonies of international importance on Banks Peninsula

Colony	1960	1996	2012	2017	2020	2023	2024
Sumner Head		729			264*		
East of Beacon Rock		285*					
Scrubby Bay		353					
Decanter Bay							314
South of Sail Rocks	388	280*			278*		
Pa Island and Headland	306						
Lavericks Bay North	269*	534		666			
Lavericks Bay South	297*						
North of Le Bons lighthouse	387	1038	1240				
South of Le Bons lighthouse		454					
East Head		766	2200	343	399		
Ducksfoot Bay			270*				
Hickory Bay Nth			290*				
Hickory Bay Sth		282*					
Paua Bay		297*					
East of East Island		287*					
West of Waihiakina Bay		334					
East of Scenery Nook		282*					
Rocky Nook		329					
East of Whakamoa Reef		449					
West of Whakamoa Reef		545					
Island Bay-Long Bay	292*	268*					
Long Bay East		547					
Long Bay West		275*					
Long Bay – Snuffle Nose	389	1050			463		
Big Horseshoe Bay		261*					
Headland opp Whale Island Reef	538	855	310				
Peraki Bay		948		459			
Robinhood Bay East		393	308				298
East of Te Oka Bay – Hell’s Gate			310				
Te Oka Bay			440		352		
West of Robinhood Bay	553	802					
West of Te Oka Bay	635	604	380				
Tumbledown Bay		375					
East of Murray’s Mistake	473	976		350	391		
Murray’s Mistake			560	386			
West of Murray’s Mistake							283*
South-East of Magnet Bay		1103					821
Magnet Bay			320				
Hikuraki Bay Sth			560				
Tokoroa Bay East		362	270*				
Oashore Bay							287*
No. of colonies	11	30	13	5	6	0	5

Note: Totals are “nests/pairs”. Colonies marked with an * are slightly below the 300-nest threshold, but annual variance could bring them inside.

Appendix 3: Full spotted shag colony counts from surveys between 1960 and 2024

(number of occupied nests)

Colony	1960	1996	2012	2017	2020	2023	2024
North-west							
Scarborough	0	0	60	85	54	43	84
Sumner Head - Whitewash Head	230	729	60	113	264	10	35
Giants Nose	0	0	0	0	0	118	175
Moki Point	0	0	40	72	51	99	59
Harris Bay	0	0	0	15	22	0	85
Godley Head	1	229	0	11	77	85	87
Mechanics Bay	43	124	220	129	76	90	78
Breeze Bay	0	0	0	0	0	21	0
Livingstone Bay	0	0	0	0	2	0	0
Quail Island	0	0	0	0	0	0	0
W of Little Port Cooper	0	0	0	0	0	0	33
Little Port Cooper	110	206	0	60	64	38	2
Baleine Point	0	0	0	0	0	1	0
E of Beacon Rock	182	285	0	48	26	1	65
Island in Blind Bay	88	102	0	0	4	0	0
Blind Bay - West	117	176	0	0	43	103	0
Blind Bay - East	0	0	122	0	3	0	6
Big Bay - West	0	0	40	0	0	48	0
W of Little Pigeon Bay	214	179	0	0	47	0	21
Pigeon Bay - West	0	77	50	24	0	22	51
Island in Pigeon Bay	0	0	0	0	0	0	5
Pigeon Bay - East	15	54	0	0	0	9	0
<i>Sub-total</i>	<i>1000</i>	<i>2161</i>	<i>592</i>	<i>557</i>	<i>733</i>	<i>688</i>	<i>786</i>
North-east							
Wakaroa Pt - Whitehead Bay	243	54	40	8	3	10	1
Whitehead Bay Stack	0	0	0	34	0	35	118
Whitehead Bay - East	0	0	0	21	25	103	0
Scrubby Bay	145	353	8	8	58	5	0
Islet at Scrubby Bay	0	0	0	0	162	0	0
Manuka Bay	0	0	0	0	10	0	0
Menzies Bay	0	0	0	4	0	3	0
Menzies Bay - East	0	0	0	0	0	1	0
Squally Bay	102	70	0	0	0	42	0
W of Decanter Bay	0	0	0	0	0	0	24
Islet at W Head of Decanter Bay	0	0	0	0	0	0	6
Decanter Bay	216	232	100	1	227	52	314
Decanter Bay rock stacks	0	0	50	116	0	17	0
Little Akaloa - West	0	0	0	0	5	0	0
Little Akaloa - East	0	67	3	6	7	5	0
W of Long Lookout Point	60	115	22	38	0	123	45
S of Sail Rocks	388	280	120	666	278	71	184
Islet W of Pa Island	0	0	0	0	0	0	21

Pa Island and headland	306	94	0	43	48	52	172
Pa Island Bay - South	0	93	0	34	10	102	0
Ducksfoot Bay	111	0	270	63	5	40	0
Ducksfoot Bay stack	0	0	0	2	0	0	0
Lavericks Bay - North	269	534	218	144	137	0	3
Lavericks Bay rock stack	0	0	10	64	58	2	0
Lavericks Bay - South	297	0	0	0	54	2	30
Katawa Head - North	0	0	180	85	112	29	0
Katawa Head islets	0	0	160	17	74	92	0
Katawa Head - West	0	0	0	53	25	88	0
Le Bons Bay	0	9	11	0	6	0	0
Steep Head - West	0	0	15	0	0	0	0
<i>Sub-total</i>	<i>2137</i>	<i>1901</i>	<i>1207</i>	<i>1407</i>	<i>1304</i>	<i>874</i>	<i>918</i>

South-east

Lighthouse - North	387	1038	1240	89	142	0	0
Lighthouse - South	0	454	110	122	0	95	0
East Head cluster	100	766	2200	343	399	93	106
Stack between East Head and Poutākoro Head	0	0	0	0	0	19	2
Poutākoro Head	0	0	0	31	16	15	10
Poutākoro Head islet	0	0	0	2	0	0	0
Hickory Bay - North	234	107	290	125	57	25	6
Hickory Bay - South	112	282	0	49	61	0	64
Crown Island	60	92	0	10	0	0	26
Cliffs opposite Crown Island	0	0	0	0	0	0	77
Stack S of Crown Island	0	0	0	0	0	0	25
North Head	0	0	30	41	4	0	0
Goughs Bay	0	75	150	83	4	0	0
Goughs Bay - South	0	0	30	85	0	0	0
South Head	0	0	120	43	128	32	0
Paua Bay	53	297	70	78	4	19	0
Goat Point	170	161	0	18	0	0	0
Fishermans Bay	0	0	30	193	71	50	0
Clay Point	0	0	180	0	73	0	0
Shell Bay - Red Bay	5	20	70	49	56	43	28
The Horseshoe	134	22	15	0	8	0	82
Otanerito Bay - North	7	178	0	113	32	57	0
Otanerito Bay - South	46	2	30	0	10	0	15
Long Reef Point	0	0	0	46	60	0	0
Reef Nook	3	2	0	0	0	0	0
Stony Bay	0	0	20	57	0	9	21
S of Short Reef Point	0	0	31	8	19	0	0
Redcliffe Nook - North	0	0	30	8	8	9	13
Redcliffe Nook Island	0	0	0	0	14	0	0
Redcliffe Nook - South	0	0	40	22	24	9	0
E of East Island (Island Nook Island)	3	287	0	0	0	18	5
East Island (Island Nook Island)	105	81	0	0	18	0	0
Island Nook	130	169	22	79	66	4	28
Flea Bay - West	0	0	0	22	4	0	0
Flea Bay - East	0	0	0	0	21	0	0
Dyke Head	8	74	0	0	0	0	0

E of Damons Bay	20	67	35	45	72	16	14
Damons Bay	0	120	20	4	14	4	0
The Amphitheatre	101	102	0	30	84	0	7
<i>Sub-total</i>	<i>1678</i>	<i>4396</i>	<i>4763</i>	<i>1795</i>	<i>1469</i>	<i>517</i>	<i>529</i>

Akaroa Harbour

Akaroa Head	0	0	35	76	0	43	0
Te Ruahine Point	20	239	15	0	0	0	12
N of Te Ruahine Point	0	0	0	0	0	0	15
S of Dan Rogers Creek	0	0	0	0	0	5	66
Dan Rogers Creek	30	209	16	47	69	0	8
Dan Rogers Caves	25	149	0	0	4	0	0
N of Dan Rogers	0	19	0	0	0	0	36
Nikau Palm Gully	0	0	31	67	0	47	52
W of Nikau Palm Gully	0	0	30	55	77	60	124
N of Nikau Palm Gully	0	0	0	0	68	25	54
Ohinepaka Bay - South	0	0	8	14	0	0	6
N of Mat Wright Bay	0	0	0	0	0	1	29
Mat Wight Bay	0	142	66	94	59	69	27
Lucas Bay	0	0	5	0	3	5	4
South of Lucas Bay - Jacobs Ladder	21	140	66	115	72	46	16
<i>Sub-total</i>	<i>96</i>	<i>898</i>	<i>272</i>	<i>468</i>	<i>352</i>	<i>301</i>	<i>449</i>

South-west

Waihuiakina Bay	3	0	10	39	0	0	0
W of Waihuiakina Bay	0	334	40	37	107	0	11
E of Scenery Nook	35	282	10	49	35	2	48
Scenery Nook	0	0	77	100	144	0	5
Squally Bay	0	0	0	44	0	0	0
Squally Bay stack	0	0	0	6	0	0	0
W of Squally Bay	0	0	30	0	20	0	0
Rocky Nook Islet	0	0	0	5	0	0	0
Rocky Nook	95	329	36	206	45	10	0
E of Whakamoia Reef	0	449	0	23	97	0	160
W of Whakamoia Reef	130	545	110	128	196	0	0
E of Island Bay	0	0	0	0	0	0	204
Island Bay - East	0		0	68	45	32	131
Island Bay - West	0		0	24	12	5	3
Island Bay (East & West combined)		165					
Island Bay - Long Bay	292	268	20	133	142	22	18
Long Bay - East	87	547	67	60	120	33	33
Long Bay - West	125	275	30	98	14	2	20
Long Bay - Snuffle Nose	389	1050	70	180	463	0	100
Big Horseshoe Bay - East	0	261	77	57	96	7	114
Big Horseshoe Bay - West	86	90	6	111	85	17	38
Little Horseshoe Bay - East	0	141	0	42	26	0	69
Little Horseshoe Bay - West	64	169	45	118	249	2	15
Headland opposite Whale Island reef	538	855	310	22	24	22	115
Peraki Bay (E & W combined)		948					
Peraki Bay - East	43		74	94	33	8	51
Peraki Bay - West	165		110	365	417	101	50

E of Robinhood Bay	0	0	0	0	0	6	172
Robinhood Bay - East	69	393	308	137	215	21	298
Robinhood Bay - West	76	178	0	115	5	19	1
W of Robinwood Bay	553	802	260	240	200	3	68
E of Te Oka Bay - Hell's Gate	250	204	310	115	63	38	107
Te Oka Bay - East	9	241	440	35	207	0	54
Te Oka Bay - West	0	0	0	199	17	30	56
W of Te Oka Bay	635	604	380	137	352	60	150
Tumbledown Bay	227	375	0	130	100	26	67
E of Murray's Mistake	473	976	90	350	391	140	47
Murray's Mistake	8	157	560	386	160	0	48
Rock stack off Murray's Mistake	0	0	0	30	0	0	0
W of Murray's Mistake	10	105	40	13	117	1	283
SE of Magnet Bay	137	1103	0	189	251	8	821
Magnet Bay	182	122	320	9	0	8	0
Hikuraki Bay - South	0	0	560	0	81	42	1
Hikuraki Bay - North	0	0	40	3	12	0	20
Tokoroa Bay - Hikuraki Bay	26	139	40	64	39	0	6
Tokoroa Bay - East	143	362	270	39	55	16	5
Tokoroa Bay - West	4	114	40	6	50	16	23
E of Oashore Bay	6	161	50	99	19	0	0
Oashore Bay	0	0	102	259	11	14	287
Birdlings Flat – W est of Oashore	16	23	0	0	0	101	0
<i>Sub-total</i>	<i>4876</i>	<i>12767</i>	<i>4932</i>	<i>4564</i>	<i>4715</i>	<i>812</i>	<i>3699</i>
Total	9787	22123	11766	8791	8573	3192	6381
Observers	Turbott & Bell (1995)	Doherty & Brager (1996)	Crossland & Crutchley (2017)	CCC	CCC	CCC	CCC

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