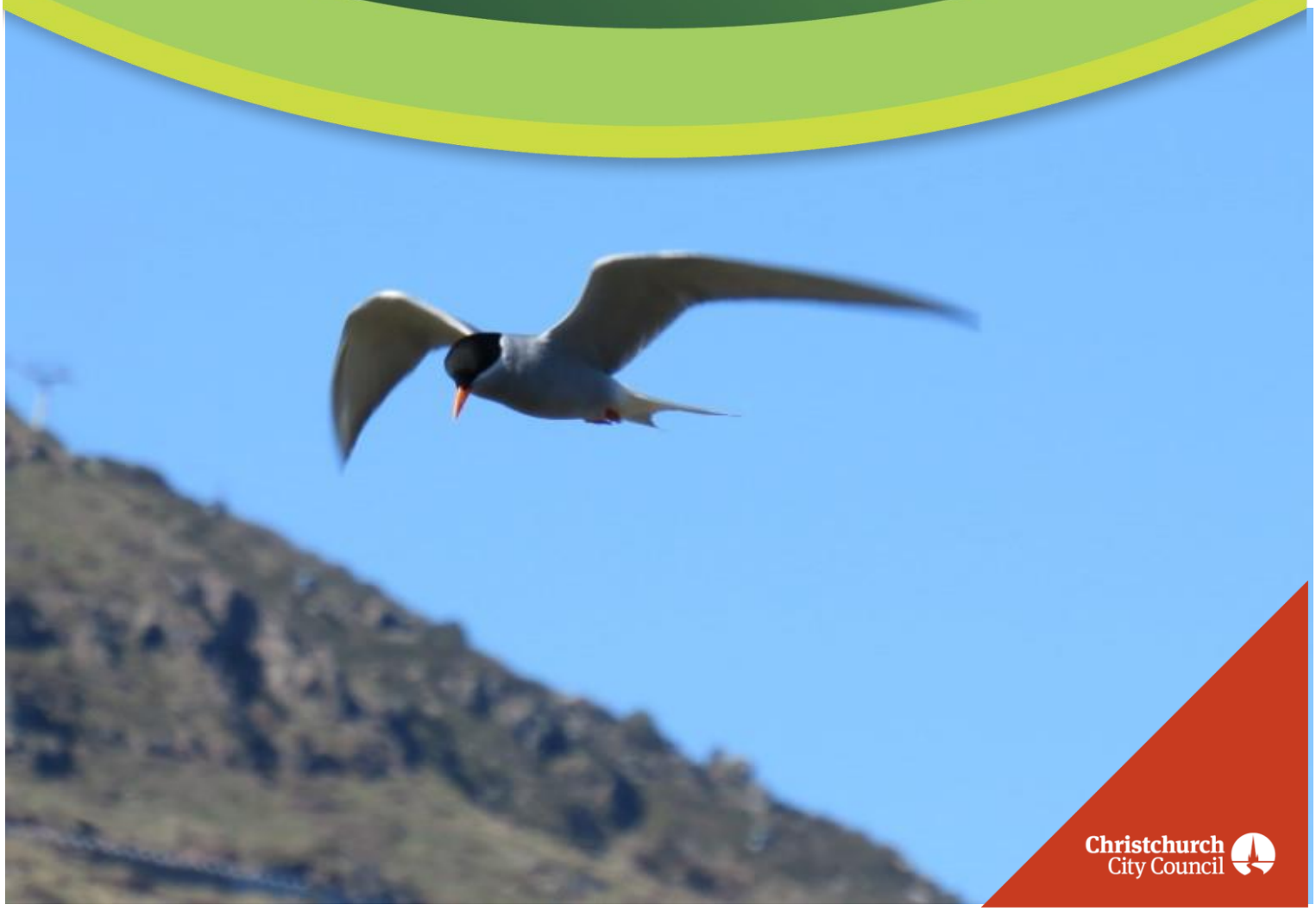
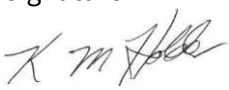
Lower Heathcote-Ferrymead floodplain

Avian biodiversity status & management guidelines

Andrew Crossland /April 2024



Christchurch City Council

Approvals Panel			
Author	**Andrew Crossland** Ecologist/Ornithologist Parks Planning & Asset Management	**Date** 4th April 2024	Signature 
Reviewed by	**Dr Antony Shadbolt** Team Leader - Biodiversity Parks Planning & Asset Management	**Date** 4th April 2024	Signature 
Approved by	**Kay Holder** Manager, Regional Parks	**Date** **12 April 2024**	Signature 

Contents

Introduction

This report provides an overview of birdlife found within the Lower Heathcote-Ferrymead Floodplain - a c.200 ha component of the Avon-Heathcote Estuary/Ihutai coastal wetland system. The focus area includes the tidal reaches and floodplain of the lower Ōpāwaho/Heathcote River; the Avoca Valley Stream tidal wetlands; grassland paddocks in Ferrymead and along Tunnel Rd; and the lower part of the lower Woolston Loop (Refer Figure 1).

Figure1: *View over the Ferrymead paddocks and Heathcote Loop toward the motorway paddocks with extensive surface water ponding evident following heavy rain.*

The focus area comprises Christchurch City Council (CCC) administered parkland, esplanade reserve or waterway, with some pockets of Crown land around the fringes. Parts of the area are designated Sites-of-Ecological-Significance (SES) under the Christchurch District Plan. This report revises and replaces previous information provided in Harris & Crossland 1990; Crossland 1993, 1994 & 2003). For an historical overview and a summary of changes in bird populations from the 1840s to the early 2000s, refer to Crossland (2003)[1].

[1] https://estuary.org.nz/wp-content/uploads/2024/01/Prenotification-Plan-Change-17-Ecological-Values-and-Wildlife-Opportunities-of-the-Lower-Heathcote-Valley-Floodplain-March-2003.pdf

Figure 2: *Lower Heathcote-Ferrymead Flood Plain study area (green shaded areas are CCC land; yellow shaded areas are Crown land).*

Figure 3: *Locations referred to in this report.*

Avifaunal inventory

- The Avon-Heathcote Estuary/Ihutai and environs are recognised as both a nationally and internationally important habitat for birdlife, with over 160 bird species recorded since 1840. At peak times of year, as many as 30,000 wetland/coastal birds may be present.
- Since 1980, some 71 bird species have been recorded in the Lower Heathcote-Ferrymead Floodplain study area (Table 1; Appendix A). This list includes 20 introduced species; 43 indigenous species; and eight overseas migrants/vagrants (little egret, bar-tailed godwit, Asiatic whimbrel, grey-tailed tattler, ruddy turnstone Arctic skua, Oriental cuckoo and spine-tailed swift).
- Thirty-six resident bird species (defined as those that can be found year-round) comprise 21 indigenous/migratory and 15 introduced species. Local breeding populations of most of these species are augmented from late summer to early winter by seasonal influxes of the same species that have bred elsewhere and visit during the non-breeding season.
- Seasonal/regular visitors (those that occur annually, either in certain seasons or sporadically over the year) comprise ten indigenous/migratory and one introduced species.
- Irregular visitors (which occur annually or near-annually with no obvious pattern or frequency) comprise nine indigenous/migratory species and three introduced species.
- Vagrants (those recorded less often than once every five years) comprise nine indigenous/migratory and two introduced species.
- Following the most recent review of the conservation status of New Zealand Birds (Robertson *et al.* 2021), nine bird species found within the Heathcote-Ferrymead Floodplain are classified as "Threatened", and a further 14 are classified as "At Risk. More detail on these species, including a summary of occurrence and habitat use, is provided in Appendix B.

Table 1. *Status of Bird Species in the Lower Heathcote-Ferrymead Floodplain, 2024.*

Status	Indigenous & migratory species	Introduced species
Resident	2	2
Resident with seasonal pop. influxes	19	13
Seasonal/regular visitor	10	1
Irregular visitor	9	3
Vagrant	9	1
Status requires confirmation	2	0
TOTAL	51	20

Current and future potential bird habitat values

The Lower Heathcote-Ferrymead floodplain supports a sizeable wetland bird population, including typically 50 to 400 individuals within the tidal habitats of the Heathcote Loop; 50 to 250 within the Ferrymead wetlands and paddocks, and upwards of 50 individuals shared between the Avoca Valley tidal wetlands and the adjacent Tunnel Road Motorway paddocks. The most abundant indigenous wetland bird species are grey teal (with flocks of up to 300 occurring from late summer to early winter); pukeko (over 200 birds in winter); paradise shelduck, pied stilt, South Island pied oystercatcher and southern black-backed gull (each with over 30 individuals at times). Other species of note in smaller numbers include white-faced heron, royal spoonbill, bar-tailed godwit, spur-winged plover, black-billed gull, red-billed gull and several cormorant (shag) species (see appendices A & B).

Over the past five decades, following the competition of the Woolston Industrial Sewer in 1971 (and cessation of industrial waste discharge into the river), the condition of the mudflats and waters of the Heathcote loop have greatly improved and now provide rich feeding habitat for birdlife. The Heathcote loop is also an important secondary high tide roost/rafting area within the wider Avon-Heathcote Estuary - used both by birds that have been feeding within the loop and by others that fly in from the estuary and Linwood Paddocks. Numbers vary daily but sometimes can total several hundred birds, with the dominant species being grey teal, stilts, oystercatchers, plovers, herons, spoonbills, herons and cormorants. (Table 2, Appendices C& D).

Figure 4: *South Island pied oystercatchers (A) and grey teal (B) roosting/rafting at the Heathcote Loop over high tide on 20/2/2024.*

The Heathcote Loop saltmarshes have historically been an important local breeding site for wetland birds, but progressive die-back of saltmarsh vegetation and increased high tide levels has led to the near cessation of nesting activity. On a large spring tide there is almost no “freeboard” available for nests to escape inundation and they are all flooded. As spring tides occur on a monthly cycle and the eggs of most waterbirds take more than five weeks to hatch, it is impossible for eggs to escape drowning.

Figure 5: *Heathcote Loop Saltmarsh almost fully inundated during a combined large spring tide and flood event. July 2017.*

Three islands on the south-west side of the Heathcote Loop formerly provided nesting habitat for pied stilts but harassment by dogs and predation by black-backed gulls and mammalian predators currently prevents this. Restoration of these islands as safe nesting/roosting habitat would be highly beneficial.

Figure 6: *Three saltmarsh islands in the Heathcote Loop that were formerly important bird nesting/roosting sites.*

In recent years, wetland bird species have been taking advantage of both constructed and self-regenerating salt-influenced habitats within the floodplain. These locations were all former saltmarshes that had been converted to farmland in the 19th Century and include the Ferrymead wetlands, parts of the Ferrymead paddocks, Avoca Valley Stream tidal wetlands and Tunnel Road saltmarsh.

As tide levels rise relative to land levels (due to both climate-induced sea level rise and to post-earthquake land settlement), salt-tolerant vegetation is migrating landward while freshwater vegetation is retreating. This process is also bringing in salt-tolerant biota like crabs and mud snails, as well as estuarine fish and birds. Exotic pasture has been rapidly converting to saltmarsh habitats as the original indigenous vegetation (removed by drainage, fire and conversion to farmland in the 1850s-60s) is claiming back the ground it lost more than 170

years ago. The benefits of this include the new provision of replacement habitat as the Heathcote Loop saltmarshes die back; enhanced nesting/feeding/roosting sites for birdlife; an expansion of tidal creek habitat for inanga, smelt, mullet, flounder and other fish; and a widening of the estuarine habitat along the lower Heathcote River. Habitat restoration through natural regeneration such as this is a far cheaper option than planting programmes with nursery-grown plants, weed-killing chemicals and fertilizer. Salt water is one of the best weed killers on the planet, facilitating the replacement of exotic grasses and weeds with indigenous marsh plants and maintaining a saline/brackish environment where maintenance needs are minimal because regrowth of weeds is limited by salt stress.

Figure 7: *Flock of paradise shelduck on the constructed Lower Avoca Valley Stream tidal wetlands (behind Ferrymead Golf). March 2018.*

Wetland bird population trends

Annual monitoring of wetland birds during the peak post-breeding period (Jan-March) has been undertaken on the Heathcote Loop for almost 40 years - since 1985. Bird survey data is stored on CCC TRIM files 14/414066 (Heathcote Loop), 14/511163 (Ferrymead Wetlands), 14/1404789 (Avoca Valley Stream tidal pond), and 14/519823 (Cumnor Terrace cormorant roost). Recent bird monitoring data from 2019 to 2024 is provided in appendices C, D & E of this report. Data for the period 1985 to 2003 can be accessed online in Crossland (2003)[2]:

Across coastal Canterbury, peak bird numbers occur in late summer (early Jan-March) when indigenous species that have bred inland return to coastal wetlands for post-breeding flocking, moulting and to transit prior to migrating further north. There they join coastal resident species and international migratory species that will depart New Zealand in the latter part of March. Wetland bird numbers are censused on core habitats across Christchurch and Banks Peninsula at this time and longitudinal data for the Heathcote Loop is presented in Table 2.

These data (Table 2) show that bird numbers were very high in the late 1980s when large numbers of gulls formerly bred within the Heathcote Loop close to the old Heathcote County rubbish tip, and many mallard ducks used the mudflats as a resting area between feeding spells at the former Heathcote Valley malt works. The

[2] https://estuary.org.nz/wp-content/uploads/2024/01/Prenotification-Plan-Change-17-Ecological-Values-and-Wildlife-Opportunities-of-the-Lower-Heathcote-Valley-Floodplain-March-2003.pdf

mudflats themselves were still recovering from decades of industrial waste dumping so birds that actually fed within this habitat were few. The main use by birds was limited to roosting and nesting.

During the 1990s and 2000s environmental conditions in the Heathcote Loop broadly improved and wetland birds increasingly began to feed on the mudflats and tidal channels.

Following the 2010-12 earthquakes both overall bird numbers and species richness increased. Bar-tailed godwits, royal spoonbills, grey teal, and the two smaller gulls became much more numerous, spending the low tide period feeding within the loop rather than moving to the estuary proper. Bird abundance fell in the 2018-2021 period (for reasons unknown) but have increased to much higher levels in 2022-2024.

Table 2a. *Heathcote Loop late summer (Jan-Mar) peak wetland bird population trend counts 1987 – 1999.*

Species	Jan 1987	March 1988	Jan 1989	Jan 1990	Jan 1991	Jan 1992	Feb 1994	Jan 1995	Feb 1996	Feb 1998	Feb 1999
Black swan	0	0	0	4	0	0	0	0	0	0	0
Canada goose	0	0	0	0	0	0	0	0	0	0	0
Paradise shelduck	14	2	0	0	0	0	0	0	0	0	0
Mallard/hybrid	210	n.c.	60	44	51	n.c.	55	n.c.	n.c.	n.c.	52
Grey teal	0	0	0	0	0	0	0	0	0	0	0
Australasian shoveler	0	0	0	0	2	0	0	0	0	0	0
New Zealand scaup	0	0	0	0	0	0	0	0	0	0	0
Little cormorant	2	n.c.	3	0	6	1	4	4	n.c.	n.c.	4
Black cormorant	1	n.c.	0	1	27	8	7	2	n.c.	n.c.	4
Pied cormorant	0	n.c.	0	0	2	0	0	0	n.c.	n.c.	1
Little bk cormorant	0	0	0	0	0	0	0	0	0	0	0
Spotted shag	0	0	0	0	1	0	0	0	0	0	0
White-faced heron	14	44	28	20	15	20	14	10	n.c.	n.c.	9
Royal spoonbill	0	0	0	0	0	0	0	0	0	0	0
Swamp harrier	n.c.	1	n.c.	1	1	n.c.	n.c.	n.c.	n.c.	n.c.	0
Pukeko	n.c.	n.c.	2	n.c.	7	n.c.	4	n.c.	n.c.	0	0
Var. oystercatcher	0	0	0	0	0	0	0	0	0	0	0
SI pied oystercatcher	14	63	12	28	24	93	18	9	23	2	18
Pied stilt	18	54	4	10	6	48	6	18	38	48	16
Spur-winged plover	6	8	0	0	2	4	12	7	20	0	23
Bar-tailed godwit	0	0	0	0	0	0	0	0	33	0	3
Black-backed gull	790	1220	n.c.	n.c.	14	n.c.	9	n.c.	n.c.	n.c.	16
Black-billed gull	0	0	0	0	0	1	0	0	0	0	0
Red-billed gull	30	n.c.	n.c.	n.c.	9	n.c.	12	n.c.	n.c.	n.c.	33
Caspian tern	0	0	0	0	0	0	0	0	0	0	0
White-fronted tern	0	0	0	0	1	0	0	0	0	0	0
Black-fronted tern	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**1099+**	**1392+**	**109+**	**108+**	**168**	**175+**	**141**	**50+**	**114+**	**50+**	**179**

Table 2b. *Heathcote Loop late summer (Jan-Mar) peak wetland bird population trend counts 2003 – 2015*

Species	Jan 2003	Feb 2004	Jan 2005	Feb 2006	March 2008	Jan 2010	Feb 2011	Feb 2012	Jan 2013	Feb 2014	Feb 2015
Black swan	0	0	0	0	0	0	0	0	0	0	0
Canada goose	0	0	0	0	0	0	0	0	0	0	0
Paradise shelduck	0	9	0	2	1	2	8	0	0	0	7
Mallard/hybrid	44	87	48	7	10	0	83	22	37	51	22
Grey teal	0	8	2	0	28	12	34	27	58	82	11
Australasian shoveler	0	0	0	0	0	0	0	0	0	0	0
New Zealand scaup	0	0	1	0	29	4	0	0	0	0	0
Little cormorant	0	7	0	2	0	5	1	2	1	3	2
Black cormorant	3	15	1	3	0	1	2	2	1	0	0
Pied cormorant	1	9	0	2	0	3	5	0	1	3	2
Little bk cormorant	0	0	0	0	0	0	0	0	0	0	0
Spotted shag	0	0	0	0	0	0	0	0	0	0	0
White-faced heron	14	11	6	2	0	14	2	7	3	4	2
Royal spoonbill	0	0	0	0	0	0	0	4	0	1	0
Swamp harrier	0	2	0	2	n.c.	0	0	0	0	0	0
Pukeko	0	3	0	0	0	0	0	0	0	2	6
Var. oystercatcher	0	0	0	0	0	0	0	0	0	0	0
SI pied oystercatcher	16	30	4	0	2	10	1	13	16	22	10
Pied stilt	27	18	5	6	12	23	9	24	9	2	32
Spur-winged plover	21	5	13	0	4	4	20	8	20	5	4
Bar-tailed godwit	0	54	10	0	0	81	172	33	4	7	0
Black-backed gull	10	14	7	2	0	11	15	17	38	67	138
Black-billed gull	0	0	0	0	0	6	0	0	0	0	0
Red-billed gull	104	39	5	1	0	124	31	2	32	38	5
Caspian tern	0	1	0	0	1	1	0	0	0	0	0
White-fronted tern	0	1	0	0	0	0	0	0	0	0	0
Black-fronted tern	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**240**	**313**	**102**	**29**	**87**	**301**	**383**	**161**	**220**	**287**	**241**

Figure 8: *Roosting pied stilts, spur-winged plovers and South Island pied oystercatchers, Heathcote Loop, February 2020.*

Table 2c. *Heathcote Loop late summer (Jan-Mar) peak wetland bird population trend counts 2016 – 2024 .*

Species	Feb 2016	Feb 2017	Feb 2018	Feb 2019	Feb 2020	Feb 2021	Feb 2022	Feb 2023	Feb 2024
Black swan	0	0	0	0	0	0	0	0	6
Canada goose	0	0	0	0	0	0	0	0	0
Paradise shelduck	0	0	0	0	0	0	2	0	2
Mallard/hybrid	4	6	4	2	0	18	26	2	4
Grey teal	0	1	23	2	5	0	17	144	246
Australasian shoveler	0	0	0	0	0	0	0	0	0
New Zealand scaup	0	0	0	0	0	0	0	0	0
Little cormorant	5	4	0	1	2	0	1	1	1
Black cormorant	0	1	0	0	0	0	1	1	0
Pied cormorant	0	2	0	1	9	2	3	8	7
Little bk cormorant	0	7	0	0	16	0	6	0	0
Spotted shag	0	0	0	0	0	0	0	0	0
White-faced heron	2	3	3	2	2	4	7	10	13
Royal spoonbill	0	7	0	3	0	1	12	1	12
Swamp harrier	0	0	0	0	0	0	0	0	1
Pukeko	0	0	0	0	0	2	2	0	6
Var. oystercatcher	0	0	0	0	0	0	0	0	1
SI pied oystercatcher	8	1	7	34	23	6	34	9	19
Pied stilt	2	77	0	0	55	2	86	4	4
Spur-winged plover	15	4	8	2	4	34	13	18	25
Bar-tailed godwit	0	0	0	0	0	0	36	0	0
Black-backed gull	71	61	0	11	9	21	34	26	39
Black-billed gull	0	0	1	0	0	0	16	11	8
Red-billed gull	0	1	0	0	0	0	10	7	17
Caspian tern	2	1	1	0	2	0	2	0	1
White-fronted tern	0	0	0	0	0	0	0	0	0
Black-fronted tern	0	0	0	0	3	0	0	0	0
TOTAL	**109**	**176**	**47**	**58**	**130**	**90**	**308**	**244**	**412**

The Lower Heathcote-Ferrymead Floodplain supports both a sizeable breeding and wintering site for New Zealand kingfisher. Up to 30 birds may be present in autumn-winter when local breeders are joined by birds that have bred on the slopes of the Port Hills. Numbers are not reflected in the bird monitoring data because the species is small, highly mobile and easily overlooked. They are therefore seldom accurately counted on a general avian survey.

The status of Australasian bittern (Threatened – Nationally Critical) and marsh crake (At Risk – Declining) is unclear, but both species are likely present as residents or seasonal visitors. Future wetland habitat restoration in this area (coupled with a predator control program) could potentially facilitate the establishment of a core breeding population of these two species (and potentially also spotless crake, and reintroduced South Island fernbird).

Royal spoonbill (At Risk – Naturally Uncommon) numbers using the Heathcote Loop as a feeding and roosting site have increased substantially in recent years. Internationally important numbers of this species (>1000) now occur in the Greater Christchurch area with recent establishment of several breeding colonies. The Lower Heathcote is a prime candidate for a future colony site.

Cormorants/shags (five species) are regularly seen in small numbers by day throughout the Heathcote loop and lower river. The cormorant night roost in the riverbank stand of old eucalypts and pines along the Heathcote River at Cumnor Terrace (former Kennaway Farm) is one of the most important roost sites for little cormorant (At Risk – Relic) within the estuary area. The roost is also used by smaller numbers of little black cormorant (At Risk – naturally uncommon), black cormorant (At Risk – Relic), pied cormorant (At Risk – Recovering) and white-faced heron. There is a realistic chance that one or more of these species could commence breeding at this site in the future. The site needs protection from disturbance however as the encroachment of industrial development, blocking of flight lines by tall storage of shipping containers, and more frequent recreational traffic along an informal pathway beneath the trees are implicated in much lower numbers of birds using the roost as compared to the past. The highest risk of disturbance is by human activities at night close to the roosting trees. Bikes with lights (particularly strobe lights) and loud human voices frighten birds roosting up in the trees.

Table 3. *Cumnor Terrace cormorant roost, dusk counts 2006 – 2023.*

Species	1 Aug 2006	3 Aug 2006	21 Apr 2009	26 Feb 2010	20 Mar 2011	29 Feb 2012	16 Apr 2023	23 Apr 2023	26 Apr 2023	12 Jun 2023
Black cormorant	1	1	0	0	2	2	1	0	0	0
Pied cormorant	3	3	7	2	6	12	1	0	0	2
Little cormorant	112	100	18	29	15	7	25	42	20	21
Little black cormorant	0	0	0	0	0	0	1	1	0	0
Spotted shag	0	0	0	0	0	0	1	4	3	0
White-faced heron	0	0	0	0	0	0	1	0	0	0
Royal spoonbill	0	0	0	0	0	0	0	0	0	1
TOTAL	**116**	**104**	**25**	**31**	**23**	**21**	**30**	**47**	**23**	**24**

Figure 9: *Five little cormorants and one little black cormorant roosting at Cumnor Terrace, 22 August 2017.*

Grassland bird population trends

The most abundant indigenous bird species on grasslands within the Lower Heathcote-Ferrymead Floodplain are pukeko, followed by paradise shelduck and spur-winged plover. Swamp harriers occur in low numbers and both New Zealand falcon and New Zealand pipit are scarce seasonal visitors. The three main blocks of paddocks – Ferrymead, around Lower Avoca Valley Stream, and alongside the Tunnel Road motorway – supported a sizeable population of pukeko up until the early 1980s, but this declined through the mid-1980s to the early 2000s. The population began to recover in 2004 and has been strong for the last 20 years. pukeko census data from late summer (Jan-Feb) and winter (June) for the period 1981 to 2024 is presented in table 4 below:

Table 4. *Lower Heathcote-Ferrymead Pukeko post-breeding (Jan-Feb) and winter (June) census data.*

	1981	1990	1992	1995	1998	2000	2004	2005	2006	2007	2008	2009	2010	2011
Jan/Feb	--	--	--	--	--	--	--	--	--	--	--	--	40	--
June	100	54	48	24	19	56	158	168	162	262	224	202	121	216

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Jan/Feb	72	--	39	39	--	44	27	70	100	63	64	120	132
June	174	175	122	102	97	114	211	197	194	179	159	223	--

Woodland birds

Small numbers of bellbird and shining cuckoo occur seasonally in wooded habitats within the floodplain, joining the three ubiquitous and widespread indigenous bird species found across Christchurch – silvereye, grey warbler and South Island fantail. No indigenous land bird currently occurs in numbers of conservation significance.

Woodland bird monitoring along riparian vegetation on the Heathcote riverbank downstream of Tunnel Road Bridge was undertaken over a 12-month period between March 2006 and February 2007 and repeated in the same months during 2023-2024 (Tables 5 & 6). These surveys used the "slow-walk transect" method, following a set path and recording all woodland birds seen or heard within 10 m on either side of a 470m centre line. Both surveys were undertaken by the same observer under similar conditions so are comparable.

Figure 10: *Woodland monitoring transect (indicated in yellow) within the context of the wider floodplain.*

Woodland bird abundance followed typical patterns recorded across Christchurch (Crossland & Navis 2013) within indigenous species being most abundant in autumn-winter. Most introduced species showed highest abundance in the late spring-summer period (when they were breeding locally) and were less abundant in winter when they disperse to parkland and grasslands.

***Table 5**. Woodland Bird Monitoring (March 2006 to February 2007)*

Species	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Acc. total	Relative abundance
Indigenous species														**22.7%**
Grey warbler	1	2	0	1	1	0	1	0	0	0	0	0	6	1.4%
South Island fantail	0	1	0	0	2	0	0	1	0	0	0	0	4	0.9%
Silvereye	9	2	8	2	16	4	1	1	11	9	4	6	73	16.9%
Bellbird	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Shining cuckoo	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
NZ kingfisher	0	2	1	0	2	2	0	0	0	0	1	0	8	1.9%
Welcome swallow	0	0	0	0	2	0	1	0	1	0	0	0	4	0.9%
Swamp harrier	0	0	0	0	1	0	0	1	0	1	0	0	3	0.7%
Introduced species														**77.3%**
European chaffinch	3	1	0	1	6	1	5	3	3	4	4	3	34	7.9%
Greenfinch	0	1	2	0	1	3	19	12	9	12	3	0	62	14.4%
European goldfinch	0	2	1	5	5	0	1	13	3	8	5	4	47	10.9%
Common redpoll	0	0	1	0	0	0	3	4	2	5	3	2	20	4.6%
House sparrow	0	0	2	1	3	2	0	2	1	3	2	2	18	4.2%
Dunnock	1	2	2	0	3	0	0	2	2	1	1	1	15	3.5%
Eurasian blackbird	1	1	4	2	3	4	1	1	1	1	2	1	22	5.1%
Song thrush	1	0	0	0	1	1	1	0	0	0	0	0	4	0.9%
Common starling	10	8	2	4	3	4	4	11	6	31	3	3	89	20.6%
W-backed magpie	0	1	0	0	0	0	0	2	1	0	0	0	4	0.9%
Yellowhammer	2	0	0	1	0	0	4	3	0	2	4	2	18	4.2%
Feral (rock) pigeon	0	0	0	0	0	0	0	0	1	0	0	0	1	0.2%
TOTAL	**28**	**23**	**23**	**17**	**49**	**21**	**41**	**56**	**41**	**77**	**32**	**24**	**432**	**100%**

In 2006-07, a total of 432 birds were recorded over the 12 months of surveys, with a mean of 36 birds per survey (equating to 7.7 birds per 100 metres), and a range from 17 to 77 birds. The woodland avifauna was dominated by introduced bird species (77.3%), with the most abundant being starlings (20.6%), greenfinch (14.4%) and goldfinch (10.9%), chaffinch (7.9%) and blackbird (5.1%). Indigenous birds comprised 22.7% of observations and were limited to just six species, with only silvereye (16.9%) being numerous.

Total birds recorded in the 2023-24 surveys was 391 - nine percent lower than in 2006-07. The mean was also lower at 32.6 birds per survey (6.9 per 100m) with a range of 16 to 77 birds. Species richness increased slightly with the arrival of bellbird. Although expected - because they have been recorded elsewhere in the Heathcote Valley/Mount Pleasant areas - shining cuckoo were not recorded in either survey period.

In 2023-24 Indigenous birds were more abundant (34.9% of all bird records compared to 22.7%), while conversely introduced species dropped from 77.3% to 65.1%. The most numerous species was now the indigenous silvereye (constituting almost a quarter of all bird records at 24%), followed by house sparrow (16.4%), goldfinch (12%), starling (9%), greenfinch (8.2%) and blackbird (6.1%) – all introduced species.

Over the 17-year interval between survey periods, the environment had changed in three ways. Firstly, wooded habitat had changed with an increase in the biomass of native vegetation (both in size and ground coverage of native trees as they grew larger). Secondly, there had been a reduction in the number and biomass of pine trees as some were felled or destroyed by fire. Thirdly, a low level of mammalian predator control had commenced. These changes likely benefitted indigenous bird species as evidenced by a doubling in grey warbler and the sizeable increase in silvereyes. Conversely, a reduction in introduced species that utilise tall pine trees was evident with starlings declining from 20.6% to just 9%; Greenfinches falling from 14.4% to 8.2%, and Chaffinch dropping from 7.9% to 4.1%.

Table 6. *Woodland Bird Monitoring (March 2023 to February 2024)*

Species	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Acc. total	Relative abun-dance
Indigenous species														**34.9%**
Grey warbler	1	1	0	2	2	1	1	1	1	2	0	3	15	3.8%
South Island fantail	1	2	0	1	1	0	0	0	0	0	0	1	6	1.5%
Silvereye	15	3	11	11	4	5	7	2	4	3	12	17	94	24.0%
Bellbird	0	0	0	0	0	0	0	0	0	0	0	1	1	0.3%
Shining cuckoo	0	0	0	0	0	0	0	0	0	0	0	0	0	0%
NZ kingfisher	1	1	0	0	0	0	0	0	1	1	0	2	6	1.5%
Welcome swallow	2	0	0	1	2	1	0	2	2	1	0	0	11	2.8%
Swamp harrier	0	0	0	0	0	0	0	2	1	0	0	1	4	1.0%
Introduced species														**65.1%**
European chaffinch	0	0	1	1	1	1	3	1	2	3	2	1	16	4.1%
Greenfinch	3	1	0	0	0	4	2	6	6	7	3	0	32	8.2%
European goldfinch	0	6	1	11	2	0	2	3	4	7	9	2	47	12.0%
Common redpoll	0	0	0	0	1	0	3	1	2	1	1	0	9	2.3%
House sparrow	0	2	0	0	1	1	2	2	2	4	37	13	64	16.4%
Dunnock	0	0	1	1	0	4	1	0	1	1	1	1	11	2.8%
Eurasian blackbird	1	1	2	2	2	1	4	2	2	3	3	1	24	6.1%
Song thrush	0	0	1	0	0	0	0	0	0	0	0	0	1	0.3%
Common starling	4	1	0	2	0	0	1	3	8	6	6	4	35	9.0%
W-backed magpie	0	0	0	0	0	2	0	0	0	1	0	1	4	1.0%
Yellowhammer	1	0	0	1	0	1	0	2	1	1	3	0	10	2.6%
Feral (rock) pigeon	0	1	0	0	0	0	0	0	0	0	0	0	1	0.3%
TOTAL	**29**	**19**	**17**	**33**	**16**	**21**	**26**	**27**	**37**	**41**	**77**	**48**	**391**	**100%**

The future avifaunal potential for woodland habitats within the Lower Heathcote-Ferrymead floodplain (including native coastal forest and mixed native/exotic forest) is fairly limited in the short term – bellbird, shining cuckoo and falcon perhaps likely becoming more plentiful. However, over the longer term as coastal bush and shrubland plantings mature within the floodplain and in nearby areas like the hill slopes above Heathcote Valley and around the estuary, additional species including kereru and potentially re-introduced brown creeper and South Island tomtit could establish.

Wildlife and habitat management recommendations

Habitat protection, provision & maintenance

- Provide new and restored tidal creek, tidal/brackish pools, saltmarsh and saltmeadow habitats for wetland birds within the Lower Heathcote-Ferrymead Floodplain to replace similar habitats lost due to historic land reclamation, landfills, earthquake subsidence and sea level rise within the wider Avon-Heathcote Estuary system.

- Within a perimeter where adjacent private land is protected from flooding, facilitate the restoration of tidal of influences landward into the lower Avoca Valley Stream area, as well as behind and beside the golf course landfill by opening up drains and former saltmarsh swales to the tide. Utilise surface water ponding and shallow tidal inundation to facilitate the natural conversion of exotic grassland to regenerating indigenous saltmarsh. Overall design of these habitats are outlined in the Ferrymead Development Plan and have been successfully trialled in the Avoca Valley Stream tidal wetlands development, the lower pond of the Ferrymead Wetlands, and more recently at Tunnel Road Saltmarsh habitat restoration.

Figure 11: *Tunnel Road Saltmarsh - before (2020) and after (2023) images of the habitat restoration work where fire-damaged exotic vegetation was scraped away to facilitate self-regeneration of indigenous marsh plants.*

- Extend Tunnel Road saltmarsh downstream with further excavation to remove earthquake liquefaction blockages impeding tidal inflow and to expand the saltmarsh basin. Establish coastal shrubland around the land ward edge.
- Manage floodgate operation on tidal creeks and drains to benefit the regeneration of saltmarsh and saltmeadow habitats. This may require moving control structures upstream to positions where private property can be defended from tidal water ingress, but where habitats on reserve land can benefit from tidal conditions.
- Expand the saltmeadow habitat around the middle pond within the Ferrymead Wetlands by shallow scraping to facilitate further regeneration of indigenous marsh plants.

Figure 12: *Saltmeadow vegetation (glasswort and salt grass) on the shoreline slope around the edge of the middle lake at Ferrymead Wetland. Tall exotic grasses dominate beyond the influence of tidal water and saline soils. Lowering of the ground level by a shallow scrape of 5-20cm will remove the grasses and allow indigenous vegetation to self-colonise.*

- Encourage and assist private landowners to protect and enhance pockets of indigenous saltmeadow and saltmarsh habitat that may exist on their land.
- Maintain short sward lowland wet grassland habitats for pukeko, waterfowl and waders.
- Periodically remove the accumulation of litter and woody debris that collects in Devil's Elbow saltmarsh and the main Settler's Crescent saltmarsh. These sites form natural traps for floating debris which smothers saltmarsh plants, increasing the rate and extent of die-back.
- Provide roosting structures for cormorants, kingfishers and herons.
- Consider enhancing wader and spoonbill roosting habitat by importing material such as gravel or shells to create a raised roosting island/s within the Heathcote Loop. Keep roosting islands free of invasive weeds like sea lavender and use signage, dog bylaw rules etc to keep them safe from disturbance.

Figure 13: *An example of a roost site enhancement – a mantle of shells over rock cobble at the constructed bird roost site at Tidal View on the north-west side of the Ferrymead Bridge.*

- Adjust timing of disruptive maintenance like riverbank and drain edge vegetation cutting activities to **OUTSIDE** the breeding seasons of the various waterbird taxa present at the site. If work cannot be delayed and must proceed during the breeding season then advice from an ornithologist, and possibility a bird nesting survey or a mark-out of any areas to avoid should occur.
- Protect pines and eucalypts used as nest sites and roost sites by herons and kingfishers, and as roosting habitat by cormorants and spoonbills.
- Develop buffer strips and pockets of coastal shrubland and bush where appropriate.
- Buffer the Cumnor Terrace cormorant (shag) night roost from human disturbance by establishing dense screening vegetation, positioning bike/walking tracks away from the roosting trees, and limit night activity, noise and lights.

Wildlife management

- Encourage wider use of habitats by wetland, grassland and woodland birds by increased habitat provision, improved habitat quality, lower disturbance levels and reduced predation pressures.
- If breeding commences at the Cumnor Terrace cormorant roost addition levels of protection would be required. These include: leaving trees alive and *in situ* during the breeding season; avoiding any maintenance or other disturbance-generating activity with 50m of the colony edge when birds are nesting or raising young (or within 30m from the landward side); and placement of signage.
- Monitor Canada goose numbers and take action to prevent any breeding activity.
- Enhance habitats and modify disturbance impacts on Threatened or At-Risk species that may breed within the area or attempt to colonise. Examples include grey duck (Threatened – Nationally vulnerable), Australasian bittern (Threatened – Nationally critical), and Crested Grebe (Threatened – Nationally vulnerable).
- Consider eventual bird species reintroductions when habitats are sufficiently mature and threats are adequately managed. Candidate species would potentially include South Island fernbird, South Island tomtit, brown creeper, and banded rail.
- Limit duck and goose-feeding to minimise numbers of these nuisance species.

Threat management

- Prevent further wetland reclamation and habitat degradation.
- Manage flood gate operation in a way that allows sustainable habitat management and not retreat of salt-tolerant vegetation and biota.
- Have strategies in place to quickly respond to pollution events, such as fuel and chemical spills.
- Protect wader and waterfowl roosting sites from both land-based, water-based and aerial-based disturbance.
- Develop of network of traps and bait stations to establish a wider pest animal and predator control within the floodplain. Potentially link this into the Predator Free Port Hills Programme.
- Undertake possum and predator control around the cormorant colony during the breeding season.
- Minimise dog disturbance by limiting dogs to certain pathways, public education, more effective signage, improved compliance enforcement and protective screen planting at pinch points between dog-walking pathways and core wildlife habitat.
- Manage and limit recreational watercraft and model boat activity to limit disturbance to indigenous waterbirds.
- Ensure the Heathcote Loop is included within the CCC drone bylaw as sensitive site where unfettered drone use is not permitted. Drone flights should proceed with the correct approvals and safeguards in place to ensure minimal disturbance impacts on wildlife.
- Either prohibit or effectively minimise/mitigate night biking and other nocturnal activities around the Cumnor Terrace cormorant night roost trees.

- Prohibit motorcycles and unauthorised vehicles along pathways and open spaces within the reserve areas and riverbank/mudflat/saltmarsh habitats.

Figure 14: *Educational signage in place along the path at Ferrymead saltmarsh highlighting wildlife values.*

Bird monitoring

- Continue seasonal monitoring of wetland bird populations within Heathcote Loop, Lower Avoca valley Stream wetlands and Ferrymead wetlands.
- Continue late summer and winter monitoring of pukeko numbers.
- Monitor for breeding by any newly establishing species, particularly "Threatened" and "At-Risk" species. Potential candidates (because they already occur on site occasionally) include black-fronted tern (Threatened – Nationally endangered), crested grebe (Threatened – Nationally vulnerable), grey duck ((Threatened – Nationally vulnerable), royal spoonbill (At Risk – naturally uncommon), black cormorant (At Risk – relict), little cormorant (At Risk – relict), pied cormorant (At Risk – recovering) and little black cormorant (At Risk – Naturally uncommon).
- Undertake woodland bird slow-walk transect surveys at five yearly intervals and establish a second survey transect in a different part of the reserve once habitat has been developed.
- Survey for Australasian bittern (Threatened- Nationally Critical), marsh crake (At Risk – Declining), spotless crake (At Risk – Declining) and grey duck (Threatened – Nationally Vulnerable) on a three-yearly basis.

Key avian performance indicators

- Indigenous and migratory wetland birds using the Heathcote Loop and landward tidal/brackish habitats reach annual (Jan-Mar) peak numbers of 500+ birds by 2030.
- The pukeko population is maintained at 80 + in Jan and 120+ in June.
- At least one species of cormorant has establish a breeding colony by 2035.
- Australian bittern, marsh crake, spotless crake, Australian coot and Australasian crested grebe all occur as regular seasonal visitors by 2035 and at least one of these species is confirmed as a breeding species by 2040.
- The locally extinct swampbird, South Island fernbird is reintroduced by 2040.
- The proportion of indigenous woodland birds (as measured in total individual records across a season or year in established survey transects) increases from 22.7% in 2006-2007 and 34.9% in 2010-2011 to >40% by 2035.
- Bellbird are breeding locally by 2040.
- Indigenous forest birds South Island tomtit and brown creeper are reintroduced by 2045.

Figure 15: *Royal spoonbills.*

References

Crossland, A.C. 1993. *Birdlife of the Avon-Heathcote Estuary and Rivers, and their margins*. Canterbury Conservancy Technical Series report Series No.6. Department of Conservation, Christchurch. 104 p.

Crossland, A.C. 1994. *Wetland Wildlife Habitat Manual*. Drainage and Waste Management Unit, Christchurch City Council, Christchurch. 243 p.

Crossland, A.C. 2003. Ecological Value and Wildlife Opportunities of the Lower Heathcote Valley Floodplain. Report for Parks and Waterways Unit, Christchurch City Council, Christchurch, New Zealand. 75p.

Crossland, A.C. & P. Navis. 2013. *City-wide Patterns of Bird Abundance in Bush and Woodland Habitats in Christchurch.* Greenspace Unit, Christchurch City Council, Christchurch. 21p.

Harris, R. & A. Crossland. 1990. *The Avon-Heathcote Estuary: Wildlife and Recreation Potential of the Western Margins.* Parks Unit, Christchurch City Council, Christchurch.

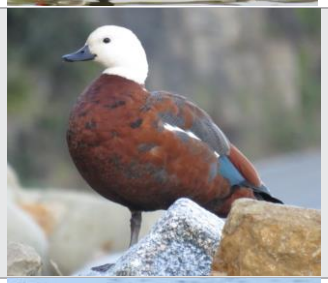
Robertson, H.A.; Baird, K.A.; Elliott, G.P.; Hitchmough, R.A.; McArthur, N.J.; Makan, T.D.; Miskelly, C.M.; O'Donnell, C.F.J.; Sagar, P.M.; Scofield, P.S.; Taylor, G.A. & P Michel. 2021. *Conservation Status of Birds in Aotearoa New Zealand 2021.* Department of Conservation, Wellington. 43p.

Shadbolt, A. 2014. *Christchurch District Plan Site of Ecological Significance, Site Significance Statement for Horseshoe Lake Reserve*. Christchurch City Council.

Appendix A.

Bird species recorded in the Lower Heathcote/Ferrymead floodplain

Indigenous and Migratory Bird species

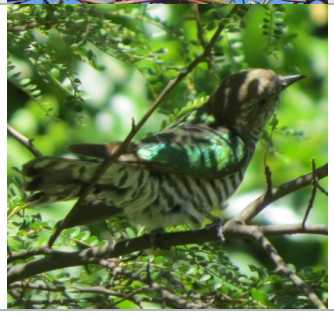
Species	Image	Threat Category	Status
Black swan *Kakī ānau/ Kakī nui*		Not Threatened	Seasonal or regular visitor
Paradise shelduck *Pūtakitaki*		Not Threatened	Resident with seasonal influxes
Grey teal *Tete*		Not Threatened	Seasonal or regular visitor
Grey duck *Pārera*		Threatened – Nationally Vulnerable	Irregular visitor
Australian shoveler *Kuruwhengu/ Tatā/ Kuruwhengi/Tataa*		Not Threatened	Resident
New Zealand scaup *Raipo/ Kukupako/ Pāpango*		Not Threatened	Resident with seasonal influxes

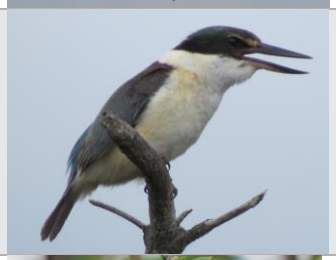
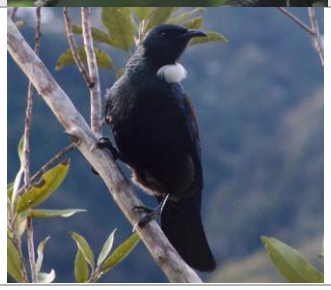
Australasian crested grebe *Kāmana/ Koukoa/ Kaaha/ Pūteketeke*		Threatened – Nationally Vulnerable	Vagrant
White-flippered little penguin *Kororā*		At Risk - Declining	Irregular visitor
Little cormorant *Kōau/ Kawaupaka*		At Risk - Relict	Resident with seasonal influxes
Black cormorant *Kōau/Kawau/ Māpunga/Kawau pū*		At Risk - Relict	Resident with seasonal influxes
Pied cormorant *Kōau/Kawau/ Kāruhiruhi*		At Risk - Recovering	Resident with seasonal influxes
Little black cormorant *Kawau Tūī*		At Risk – Naturally Uncommon	Seasonal or regular visitor
Spotted shag *Parekareka/ Kawau Tikitiki*		Threatened – Nationally Vulnerable	Irregular visitor

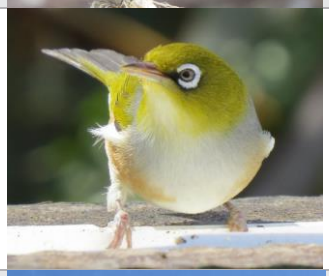
White heron *Kōtuku*		Threatened – Nationally Critical	Irregular visitor
Little egret		Not Threatened	Vagrant
White-faced heron *Matuku Moana*		Not Threatened	Resident with seasonal influxes
Reef heron *Matuku Moana*		Threatened – Nationally Endangered	Vagrant
Australasian bittern *Matuku/ Matuku-hūrepo*		Threatened – Nationally Critical	Status uncertain, likely seasonal visitor
Royal spoonbill *Kōtuku-ngutupapa*		At Risk – Naturally Uncommon	Seasonal or regular visitor
Swamp harrier *Kāhu*		Not Threatened	Resident

New Zealand falcon *Kārearea*		Threatened – Nationally Vulnerable	Irregular visitor
Australasian coot		At Risk – Naturally Uncommon	Vagrant
Pukeko *Pākura/Pūkeko*		Not Threatened	Resident with seasonal influxes
Marsh crake *Koitareke/ Kotoreke*		At risk - Declining	Status uncertain, likely seasonal visitor
South Island pied oystercatcher *Tōrea*		At risk - Declining	Resident with seasonal influxes
Variable oystercatcher *Tōrea Pango*		At risk - Recovering	Irregular visitor
Pied stilt *Poaka*		Not Threatened	Resident with seasonal influxes

Spur-winged plover		Not Threatened	Resident with seasonal influxes
Eastern bar-tailed godwit *Kūaka*		At Risk - Declining	Seasonal or regular visitor
Asiatic whimbrel *Tutei*		Not Threatened	Vagrant
Grey-tailed (Siberian) tattler		Not Threatened	Vagrant
Ruddy turnstone		Not Threatened	Vagrant
Arctic Skua		Not Threatened	Irregular visitor
Southern Black-backed gull/kelp gull *Karoro*		Not Threatened	Resident with seasonal influxes

Black-billed gull *Tārapuka*		At Risk - Declining	Resident with seasonal influxes
Red-billed gull *Tarāpunga*		At Risk - Declining	Resident with seasonal influxes
Caspian tern *Tara/Taranui*		Threatened – Nationally Vulnerable	Seasonal or regular visitor
White-fronted tern *Tara*		At Risk – Declining	Seasonal or regular visitor
Black-fronted tern *Tara/Tarapirohe*		Threatened – Nationally Endangered	Seasonal or regular visitor
Kereru/New Zealand pigeon *Kūkupa/Kererū*		Not Threatened	Irregular visitor
Shining cuckoo *Pīpīwharauroa*		Not Threatened	Seasonal or regular visitor

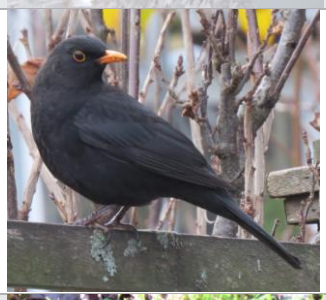
Oriental cuckoo		Not Threatened	Vagrant
Spine-tailed Swift (white-throated needletail)		Not Threatened	Vagrant
New Zealand kingfisher *Kōtare*		Not Threatened	Resident with seasonal influxes
Grey warbler *Riroriro*		Not Threatened	Resident with seasonal influxes
Bellbird *Kōparapara/ Korimako*		Not Threatened	Resident with seasonal influxes
Tui *Tūī*		Not Threatened	Irregular visitor

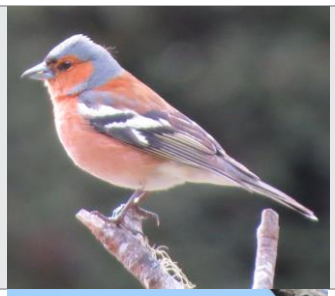
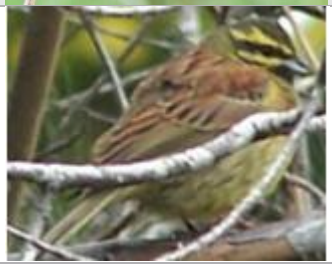
South Island fantail *Pīwakawaka/ Pīwaiwaka*		Not Threatened	Resident with seasonal influxes
Silvereye *Tauhou*		Not Threatened	Resident with seasonal influxes
Welcome swallow *Warou*		Not Threatened	Resident with seasonal influxes
New Zealand pipit *Pīhoihoi/Pioioi*		At Risk - Declining	Seasonal or regular visitor

Introduced bird species

Species	Image	Threat Category	Status
Mute swan		Introduced	Vagrant
Feral (Greylag) goose		Introduced	Irregular visitor

Canada goose		Introduced	Seasonal or regular visitor
Mallard		Introduced	Resident with seasonal influxes
Mallard x Grey duck "hybrids" (Note: excluded from species tally)		hybrid	Resident with seasonal influxes
California quail		Introduced	Irregular visitor
Feral rock pigeon		Introduced	Resident
Little owl		Introduced	Resident
Australian white-backed magpie		Introduced	Resident with seasonal influxes

Eurasian skylark		Introduced	Resident with seasonal influxes
Eurasian blackbird		Introduced	Resident with seasonal influxes
Song thrush		Introduced	Resident with seasonal influxes
Common starling		Introduced	Resident with seasonal influxes
House sparrow		Introduced	Resident with seasonal influxes
Dunnock		Introduced	Resident with seasonal influxes

Chaffinch		Introduced	Resident with seasonal influxes
European goldfinch		Introduced	Resident with seasonal influxes
European greenfinch		Introduced	Resident with seasonal influxes
Common redpoll		Introduced	Resident with seasonal influxes
Yellowhammer		Introduced	Resident with seasonal influxes
Cirl bunting		Introduced	Irregular visitor

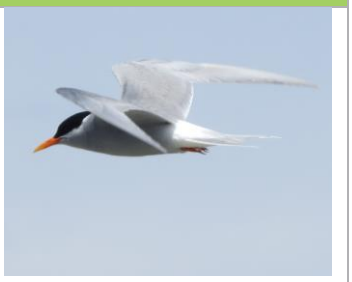
Appendix B.

Threatened and At Risk bird species recorded

Threatened – Nationally Critical

Common name	Scientific name	Comment	
Australasian bittern *Matuku/ Matuku-hūrepo*	*Botarus poiciloptilus*	• Possible seasonal visitor but no confirmed sightings since c.2010. • Likely to become regular if habitat developed. • Feeding, roosting. • Not breeding.	
White heron *Kōtuku*	*Ardea modesta*	• Seasonal visitor, late summer – autumn. • On river edge, mudflats and wetlands. • Feeding, roosting. • Not breeding.	

Threatened – Nationally Endangered

Common name	Scientific name	Comment	
Black-fronted tern *Tara/Tarapirohe*	*Childonias albostriatus*	• Increasingly regular visitor to Heathcote Loop & Ferrymead Wetlands. • Feeding, roosting. • Not breeding, but often present through the breeding season. Potential to breed in the future on atypical (marsh) habitat.	
Reef heron *Matuku Moana*	*Egretta sacra sacra*	• Vagrant to Heathcote Loop and lower river, last recorded 2006-2008 period. • Feeding, roosting.	

Threatened – Nationally Vulnerable

Common name	Scientific name	Comment	
Spotted shag *Parekareka/ Kawau Tikitiki*	*Strictocarbo p. punctatus*	• Irregular visitor at any time of year. • Fishing in main channels and roosting on shoreline. • Nearest breeding colonies close by at Scarborough and Sumner-Whitewash Heads.	
Grey duck *Pārera*	*Anas superciliosa*	• Resident until the late 1990s, now an occasional visitor. • Feeding, roosting. • Not currently breeding but may recolonise if suitable wetland habitat developed.	
Caspian tern *Tara/Taranui*	*Hydroprogne caspia*	• Year-round visitor. • Over tidal river and mudflat. • Feeding, roosting. • Not breeding.	
New Zealand falcon *Kārearea*	*Falco novaeseelandiae novaeseelandiae*	• Seasonal visitor to Port Hills slopes above estuary and Heathcote Valley. Occasionally hunts over study area. • Over woodland and grassland habitats • Not breeding.	
Australasian crested grebe *Kāmana/ Koukoa/ Kaaha/ Pūteketek*	*Podiceps cristatus australis*	• Occasional vagrant to Ferrymead Wetlands where they generally leave quickly following disturbance. • Feeding, resting. • Not breeding but potentially could colonise if disturbance and habitat managed as this species is actively colonising lowland sites.	

At Risk - Declining

Common name	Scientific name	Comment	
South Island pied oystercatcher *Tōrea*	*Haematopus finschi*	• Low numbers (10-40) year-round on mudflats and short grassland when wet. • Feeding, roosting. • Not breeding.	
Eastern bar-tailed godwit *Kūaka*	*Limosa lapponica baueri*	• Arctic migrant. • Low numbers (up to 30) occasionally present on mudflats and roosting on shoreline. • Feeding and roosting. • Never breeding in NZ.	
New Zealand pipit *Pīhoihoi/Pioioi*	*Anthus n. novaeseelandiae*	• Autumn-winter visitor from breeding areas on the tops of the Port Hills. • On salt meadow, short grassland and bare earth. • Not breeding.	
Black-billed gull *Tārapuka*	*Larus bulleri*	• Year-round visitor with occasional feeding flocks in autumn-winter. • Feeding, roosting. • Not breeding in study area but nests occasionally at Charlesworth and Bexley Wetland Reserves. • Potential to breed in study area if habitat and predator protection provided.	
Red-billed gull *Tarāpunga*	*Larus novaehollandiae scopulinus*	• Year-round. • Feeding, roosting. • Occasionally breeds around estuary with potential to colonise the study area where it does not currently breed.	

At Risk-Declining (cont'd)

Common name	Scientific name	Comment	
White-fronted tern *Tara*	*Sterna striata striata*	• Occasional visitor following schools of fish upriver with the tide. • Feeding and roosting. • Not breeding in study area. • Nearest breeding colonies at Scarborough and Godley Head	
Marsh crake *Koitareke/ Kotoreke*	*Porzana pusilla affinis*	• No recent sightings but almost certainly present as it occurs elsewhere in the estuary area. • Will benefit from suitable habitat development and predator control.	
White-flippered little penguin *Kororā*	*Eudyptula minor albosignata*	• Irregular (mainly nocturnal) visitor to lower tidal Heathcote river. • Feeding. • Not breeding.	

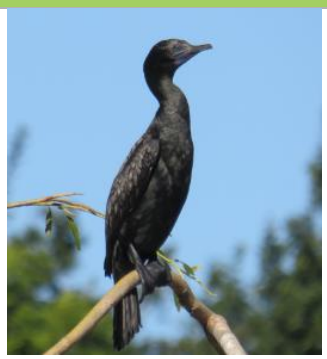
At Risk - Recovering

Common name	Scientific name	Comment	
Variable oystercatcher *Tōrea Pango*	*Haematopus unicolor*	• Occasional visitor at any time of year to mudflats and short grassland (when wet). • Feeding, roosting. • Not breeding.	
Pied cormorant *Kōau/Kawau/ Kāruhiruhi*	*Phalacrocorax varius varius*	• Year-round in low numbers • Feeding in channels. • Roosting on shoreline and on posts/trees. • Nests nearby in trees at Bromley Oxidation Ponds. • Day/night roosts in riverbank trees in Woolston Loop.	

At Risk - Relict

Common name	Scientific name	Comment	
Black cormorant *Kōau/Kawau/ Māpunga/Kawau pū*	*Phalacrocorax carbo novaehollandiae*	• Year-round in low numbers. • Feeding in water and roosting on shoreline and channel edges. • Breeds in trees on islands at nearby Bromley Oxidation Ponds.	
Little cormorant *Kōau/ Kawaupaka*	*Phalacrocorax melanoleucos brevirostris*	• Present year-round. • Feeding in water and roosting on shoreline, channel edges and trees overhanging water. • Breeds in trees at Bromley Oxidation Ponds. • Important night roost in trees in Woolston Loop which could develop into a future breeding colony.	

At Risk – Naturally Uncommon

Common name	Scientific name	Comment	
Little black cormorant *Kawau Tūī*	*Phalacrocorax sulcirostris*	• An increasingly regular visitor to study area. • Roosts in the Woolston Loop with other cormorants species. • Feeding in water and roosting on shoreline, posts, jetties and trees overhanging water. • Breeds in trees at Bromley Oxidation Ponds.	
Royal spoonbill *Kōtuku-ngutupapa*	*Platalea regia*	• Occurs year-round. • Feeding, roosting.. • Not breeding, but recent colonies established at Bromley Oxidation Ponds, Kaiapoi Oxidation Ponds, Travis Wetland, Lake Ellesmere & Lyttelton Harbour indicate likely further expansion.	

Appendix C

Heathcote Loop wetland bird monitoring (2019 - 2024)

Numbers of wetland birds using the Heathcote Loop are presented for the five-year period February 2019 and February 2024. Forty-four surveys were conducted at various tide stages with 28 species recorded and total wetland bird numbers ranging from 27 to 420. Highest numbers occurred from January to June – the non-breeding season when large numbers of birds that have bred elsewhere in the South Island arrive on the Avon-Heathcote Estuary to spend late summer-autumn-winter.

This monitoring data provides a contemporary update on species occurrence and abundance. Similar data covering 1985 to 2003 is presented in Crossland (2003), and the full c.40-year data set from 1985 to current is accessible in TRIM file #14/414066.

Figure 16: *Heathcote Loop bird survey boundaries.*

Figure 17: *Waders roosting at high tide within the Heathcote Loop.*

Table 7. *Heathcote Loop Wetland Bird Monitoring data (2019 – 2024)*

Species	14/2 2019	30/3 2019	28/4 2019	10/9 2019	20/9 2019	17/1 2020	14/2 2020	29/2 2020
	H Tide	H Tide	H tide	L Tide	Mid Tide	H Tide	H Tide	L Tide
Black swan	0	0	2	3	0	0	0	0
Canada goose	0	0	0	0	0	0	0	0
Paradise shelduck	0	0	0	0	0	0	0	0
Mallard/hybrid	2	8	5	2	4	6	0	16
Grey teal	2	9	22	0	0	0	4	0
Australasian shoveler	0	0	0	0	0	0	0	0
New Zealand scaup	0	0	0	0	0	0	0	0
Little cormorant	1	2	3	1	6	2	2	3
Black cormorant	0	2	0	1	0	1	0	2
Pied cormorant	1	9	1	1	0	3	9	5
Little black cormorant	0	0	0	0	0	0	16	13
Spotted shag	0	0	0	0	0	0	0	0
White-faced heron	2	5	3	2	7	3	2	4
Little egret	0	0	0	0	0	0	0	0
Royal spoonbill	3	0	0	0	0	0	0	1
Swamp harrier	0	1	0	0	0	0	0	1
Pukeko	0	0	0	0	3	0	0	4
Variable oystercatcher	0	0	0	0	0	0	0	0
SI pied oystercatcher	34	11	0	3	0	31	23	7
Pied stilt	0	23	0	0	0	34	55	0
Spur-winged plover	2	4	2	7	0	2	4	22
Bar-tailed godwit	0	0	0	0	0	0	0	0
Black-backed gull	11	18	5	35	10	11	9	14
Black-billed gull	0	0	0	0	0	0	0	0
Red-billed gull	0	0	2	1	11	0	0	1
Caspian tern	0	0	0	1	0	1	0	0
White-fronted tern	0	0	0	0	0	0	0	0
Black-fronted tern	0	0	0	2	0	0	3	3
TOTAL	**58**	**92**	**45**	**59**	**41**	**94**	**127**	**96**

Species	19/2 2021	4/3 2021	17/5 2021	2/7 2021	3/9 2021	29/10 2021	19/11 2021	10/12 2021
	L Tide	H Tide	H Tide	M Tide	H Tide	H Tide	H Tide	H Tide
Black swan	0	0	1	0	0	3	0	0
Canada goose	0	0	0	0	0	6	0	0
Paradise shelduck	0	0	0	0	0	0	0	0
Mallard/hybrid	18	0	6	0	0	4	13	4
Grey teal	0	6	39	0	0	0	0	0
Australasian shoveler	0	0	0	0	0	2	2	0
New Zealand scaup	0	0	0	0	0	0	0	1
Little cormorant	0	1	1	0	1	0	0	0
Black cormorant	0	0	0	1	0	0	0	0
Pied cormorant	2	3	0	0	3	1	1	3
Little black cormorant	0	0	0	0	0	0	0	0
Spotted shag	0	0	0	0	0	0	0	0
White-faced heron	4	1	1	1	10	2	5	1
Little egret	0	0	0	0	0	0	0	0

Royal spoonbill	1	0	1	4	1	0	4	2
Swamp harrier	0	0	0	0	0	0	0	0
Pukeko	2	2	0	0	0	0	0	4
Variable oystercatcher	0	0	0	0	0	0	0	0
SI pied oystercatcher	6	0	1	3	0	0	0	2
Pied stilt	2	10	10	14	0	0	0	2
Spur-winged plover	34	12	4	2	0	15	14	14
Bar-tailed godwit	0	0	0	0	0	0	31	0
Black-backed gull	21	2	1	2	27	2	23	11
Black-billed gull	0	0	0	0	0	0	0	0
Red-billed gull	0	0	0	0	0	0	3	0
Caspian tern	0	0	0	0	3	0	0	1
White-fronted tern	0	0	0	0	0	0	0	1
Black-fronted tern	0	0	0	0	0	0	0	0
TOTAL	**90**	**37**	**65**	**27**	**45**	**35**	**96**	**46**

Species	**5/1 2022**	**26/1 2022**	**20/2 2022**	**21/2 2022**	**22/2 2022**	**21/4 2022**	**28/4 2022**	**24/5 2022**
	H Tide	H Tide	H Tide	M Tide	H Tide	Mid Tide	H Tide	H Tide
Black swan	0	0	0	0	0	2	0	0
Canada goose	0	0	0	0	0	0	0	0
Paradise shelduck	0	0	0	0	2	0	0	0
Mallard/hybrid	4	0	26	24	22	38	1	0
Grey teal	2	0	0	17	0	215	288	200
Australasian shoveler	0	0	0	0	0	4	9	18
New Zealand scaup	0	0	0	0	0	0	3	0
Little cormorant	1	0	1	0	1	0	1	1
Black cormorant	0	0	1	0	1	0	0	0
Pied cormorant	1	0	1	1	3	4	2	2
Little black cormorant	0	0	0	6	0	0	0	2
Spotted shag	0	0	0	0	0	0	0	0
White-faced heron	10	1	1	7	7	9	4	3
Little egret	0	0	0	0	0	0	0	0
Royal spoonbill	0	0	12	0	0	11	17	0
Swamp harrier	0	0	0	0	0	0	0	0
Pukeko	0	0	0	2	2	4	4	2
Variable oystercatcher	0	0	0	0	0	0	0	0
SI pied oystercatcher	6	6	34	29	28	7	1	31
Pied stilt	4	23	86	58	85	2	15	16
Spur-winged plover	8	5	13	6	8	34	15	8
Bar-tailed godwit	0	0	0	36	0	0	0	0
Black-backed gull	1	10	12	34	2	32	12	0
Black-billed gull	0	0	0	16	0	10	0	0
Red-billed gull	0	1	10	0	0	8	7	8
Caspian tern	0	2	0	2	2	0	0	0
White-fronted tern	0	0	0	0	0	0	0	0
Black-fronted tern	0	0	0	0	0	0	0	0
TOTAL	**37**	**48**	**197**	**238**	**163**	**380**	**379**	**291**

Species	21/6 2022	19/8 2022	5/9 2022	16/9 2022	11/10 2022	25/10 2022	9/11 2022	21/11 2022
	H Tide	H Tide	H Tide	H Tide	L Tide	L Tide	L Tide	H Tide
Black swan	17	4	1	0	2	5	0	1
Canada goose	0	0	0	0	0	0	0	0
Paradise shelduck	2	0	2	0	0	2	10	2
Mallard/hybrid	24	5	2	4	11	6	17	3
Grey teal	106	0	0	0	2	7	2	0
Australasian shoveler	0	0	0	0	2	0	2	0
New Zealand scaup	0	0	0	0	0	0	0	0
Little cormorant	0	0	1	2	0	0	1	0
Black cormorant	0	0	0	0	0	1	0	0
Pied cormorant	0	5	3	4	1	2	2	0
Little black cormorant	0	0	2	0	0	3	0	3
Spotted shag	0	0	0	0	0	0	0	0
White-faced heron	5	8	5	3	8	6	12	2
Little egret	0	0	0	0	0	0	0	0
Royal spoonbill	3	7	4	3	0	0	0	8
Swamp harrier	0	0	0	0	1	0	0	0
Pukeko	4	0	0	0	1	0	1	1
Variable oystercatcher	0	0	0	0	0	0	0	0
SI pied oystercatcher	1	0	0	0	0	2	1	2
Pied stilt	10	0	2	0	0	4	0	0
Spur-winged plover	14	2	2	2	11	7	16	6
Bar-tailed godwit	0	0	0	0	3	5	6	0
Black-backed gull	7	30	7	22	64	39	112	15
Black-billed gull	0	0	0	0	2	0	0	0
Red-billed gull	0	0	0	3	0	1	1	6
Caspian tern	0	1	0	1	6	1	2	0
White-fronted tern	0	0	0	0	0	0	0	0
Black-fronted tern	1	0	0	0	0	0	0	0
TOTAL	**194**	**62**	**31**	**44**	**114**	**91**	**185**	**49**

Species	1/12 2022	11/1 2023	2/2 2023	16/2 2023	27/2 2023	31/3 2023	28/4 2023	12/6 2023
	H Tide	H Tide	L Tide	Mid Tide	Mid Tide	Mid Tide	L Tide	H Tide
Black swan	0	0	0	0	0	0	0	0
Canada goose	0	0	0	0	0	0	0	0
Paradise shelduck	4	8	2	0	8	0	0	0
Mallard/hybrid	6	0	21	2	6	6	0	8
Grey teal	4	0	115	144	12	212	246	370
Australasian shoveler	0	0	12	2	0	0	0	0
New Zealand scaup	0	2	0	0	0	0	2	0
Little cormorant	6	3	1	1	1	1	1	5
Black cormorant	0	1	0	1	2	0	0	1
Pied cormorant	1	1	7	8	2	4	3	1
Little black cormorant	4	0	0	0	2	24	0	4
Spotted shag	0	0	0	0	0	0	1	0
White-faced heron	3	7	10	10	15	7	7	4
Little egret	0	0	0	0	0	0	0	1

Royal spoonbill	0	0	14	1	6	6	2	3
Swamp harrier	0	0	2	0	1	0	0	0
Pukeko	0	0	0	0	11	0	0	0
Variable oystercatcher	0	0	0	0	0	0	1	0
SI pied oystercatcher	1	0	24	9	8	4	21	0
Pied stilt	0	31	1	4	4	0	4	6
Spur-winged plover	2	7	11	18	35	3	36	4
Bar-tailed godwit	0	0	9	0	0	0	0	0
Black-backed gull	13	8	48	26	53	2	18	1
Black-billed gull	1	1	2	11	2	0	12	0
Red-billed gull	11	2	82	7	156	0	2	0
Caspian tern	1	1	1	0	0	1	0	0
White-fronted tern	0	0	0	0	0	0	0	0
Black-fronted tern	0	0	0	0	0	1	0	0
TOTAL	**47**	**74**	**362**	**244**	**324**	**271**	**356**	**408**

Species	**6/9 2023**	**18/9 2023**	**20/2 2024**	**22/2 2024**
	H Tide	L Tide	H Tide	L Tide
Black swan	0	0	4	6
Canada goose	0	0	0	0
Paradise shelduck	0	0	0	2
Mallard/hybrid	2	16	12	4
Grey teal	0	0	134	246
Australasian shoveler	0	2	0	0
New Zealand scaup	0	0	0	0
Little cormorant	1	2	1	1
Black cormorant	1	0	0	0
Pied cormorant	2	2	1	7
Little black cormorant	0	0	0	0
Spotted shag	0	0	0	0
White-faced heron	4	18	11	13
Royal spoonbill	6	5	3	12
Little egret	0	0	0	0
Swamp harrier	0	0	0	1
Pukeko	0	0	6	6
Variable oystercatcher	0	0	1	1
SI pied oystercatcher	1	1	65	19
Pied stilt	0	2	58	4
Spur-winged plover	2	9	15	25
Bar-tailed godwit	0	0	0	0
Black-backed gull	21	79	6	39
Black-billed gull	2	0	0	8
Red-billed gull	0	0	2	17
Caspian tern	1	0	1	1
White-fronted tern	0	0	0	0
Black-fronted tern	0	0	0	0
TOTAL	**43**	**136**	**320**	**420**

Appendix D

Ferrymead wetlands & paddocks wetland bird monitoring (2017 - 2024)

Numbers of wetland birds counted on the chain of three ponds and the surrounding paddocks are presented for the period February 2017 to February 2024. Seventeen surveys of the combined area were undertaken at various times of the year. Twenty-six species were recorded with numbers ranging from 88 to 265.

Table 8. *Ferrymead Wetlands & Paddocks Bird Monitoring data (2017 – 2024)*

Species	21/2 2017	5/6 2017	3/3 2019	23/6 2019	14/2 2020	16/6 2020	15/2 2021	22/2 2022	21/4 2022	11/10 2022	1/12 2022
Aust. crested grebe	0	0	0	0	0	0	0	0	0	0	1
Black swan	0	0	0	0	0	0	0	0	0	0	0
Canada goose	0	0	0	0	0	0	0	8	31	0	0
Paradise shelduck	54	28	34	0	35	22	95	18	17	42	22
Feral (greylag) goose	0	0	0	0	0	0	0	0	0	0	0
Mallard/hybrid	12	21	6	28	8	0	8	0	0	7	8
Grey teal	2	19	0	0	4	1	0	4	0	0	2
Australasian shoveler	6	18	0	16	0	8	0	7	8	2	0
NZ scaup	27	132	36	42	6	11	6	2	7	14	6
Black cormorant	0	0	0	0	0	0	0	0	1	0	0
Pied cormorant	0	0	0	0	0	2	0	0	0	0	0
Little cormorant	1	0	0	1	1	0	0	1	0	1	2
Little black cormorant	1	0	0	0	0	0	0	0	0	0	0
Swamp harrier	0	0	0	0	0	0	0	0	0	1	1
White heron	0	0	0	0	0	1	0	0	0	0	0
Little egret	0	0	0	0	0	0	0	0	0	0	0
White-faced heron	0	0	0	3	0	2	0	0	0	0	2
Royal spoonbill	0	0	0	0	0	0	0	0	0	0	0
Pukeko	31	41	54	101	88	112	53	42	111	110	45
Spur-winged plover	17	6	0	10	4	8	6	6	2	6	2
Pied stilt	0	0	0	0	0	0	0	0	0	0	2
Black-backed gull	0	0	0	0	0	0	0	0	0	10	0
Red-billed gull	0	0	0	0	0	0	0	0	0	0	2
Black-billed gull	0	0	0	0	0	0	0	0	0	0	1
Black-fronted tern	0	0	0	0	0	1	0	0	0	0	0
Caspian tern	0	0	0	0	0	2	0	0	0	0	0
TOTAL	**151**	**265**	**130**	**201**	**146**	**170**	**168**	**88**	**177**	**193**	**96**

Table 8. *continued:*

Species	16/2 2023	27/2 2023	31/3 2023	28/4 2023	17/5 2023	20/2 2024
Aust. crested grebe	0	0	0	0	0	0
Black swan	0	0	0	0	0	2
Canada goose	0	0	4	0	0	21
Paradise shelduck	4	12	n.c.	n.c	23	4
Feral (greylag) goose	1	0	0	0	0	0
Mallard/hybrid	2	4	2	5	0	8
Grey teal	0	0	0	1	0	0
Australasian shoveler	2	2	0	14	10	2
NZ scaup	4	4	14	32	26	8
Black cormorant	0	0	0	0	1	0
Pied cormorant	0	0	1	0	0	0
Little cormorant	2	0	2	0	1	2
Little black cormorant	2	0	0	0	0	0
Swamp harrier	0	0	0	0	0	1
White heron	0	0	0	0	0	0
Little egret	0	0	0	0	1	0
White-faced heron	0	0	1	0	0	3
Royal spoonbill	2	0	3	0	1	0
Pukeko	72	75	n.c.	n.c.	112	57
Spur-winged plover	4	4	n.c.	n.c.	6	2
Pied stilt	0	0	0	0	0	0
Black-backed gull	0	0	0	0	0	0
Red-billed gull	0	0	0	0	0	0
Black-billed gull	0	0	0	0	0	0
Black-fronted tern	0	0	1	0	0	0
Caspian tern	0	0	0	0	0	0
TOTAL	**95**	**101**	**n.a.**	**n.a.**	**181**	**110**

Figure 18: *The middle lake in the Ferrymead Wetlands and part of the surrounding paddocks.*

Appendix E

Avoca Valley Stream tidal wetlands bird monitoring (2017 - 2024)

Wetland bird counts for the period 2017 -2024 are provided below. Numbers are low (max count 138, but most counts <40), but species richness has been growing steadily since this habitat was constructed. Twenty wetland bird species have been recorded.

Figure 19: *The Avoca Valley Stream wetlands, showing an expansive bed of the rare indigenous marsh plant Mimumlus repens.*

Table 9. *Avoca valley Stream Tidal Wetland Bird Monitoring data (2017-2024).*

Species	3/7 2017	2/8 2017	13/6 2018	2/7 2019	10/9 2019	16/6 2020	4/3 2021	4/4 2021	28/6 2021	2/7 2021	10/2 2021
Canada goose	0	0	0	0	0	1	0	1	0	0	0
Feral (greylag) goose	0	0	6	0	0	5	0	4	0	0	2
Paradise shelduck	2	2	2	2	2	0	0	0	0	2	15
Mallard/hybrid	6	4	31	0	7	1	4	6	4	35	0
Grey teal	0	0	0	0	0	0	0	0	0	0	0
Australasian shoveler	0	0	0	0	0	3	10	2	2	2	0
Black cormorant	0	0	0	0	0	0	0	0	0	0	0
Little cormorant	1	0	0	0	0	0	0	0	0	0	0
Little black cormorant	0	0	1	0	0	0	0	0	0	0	0
Swamp harrier	0	0	2	0	0	0	0	0	0	0	0
White-faced heron	0	0	0	0	1	1	1	1	0	0	1
Pukeko	2	2	16	8	8	10	8	23	32	31	12
SI pied oystercatcher	0	0	0	0	0	0	0	0	0	0	0
Spur-winged plover	0	0	0	0	0	2	4	2	2	0	0
Pied stilt	0	2	2	0	0	0	0	2	0	0	0
Black-backed gull	0	0	3	0	0	0	0	0	0	0	0
Black-billed gull	0	0	0	0	0	0	0	0	0	0	0
Caspian tern	0	0	0	0	0	1	0	0	0	0	0
NZ kingfisher	1	0	1	1	0	0	0	2	0	0	0
Welcome swallow	0	0	74	4	2	0	2	0	0	2	4
TOTAL	**12**	**10**	**138**	**15**	**20**	**24**	**29**	**46**	**40**	**72**	**34**

Table 9. *continued:*

Species	22/2 2022	28/3 2022	24/5 2022	21/6 2022	11/10 2022	25/10 2022	21/11 2022	1/12 2022	27/2 2023	18/6 2023	30/2 2024
Canada goose	7	0	5	4	0	1	4	4	0	12	11
Feral (greylag) goose	0	0	0	4	0	3	0	3	4	0	0
Paradise shelduck	23	2	0	17	2	2	13	15	4	2	8
Mallard/hybrid	12	13	8	3	0	2	4	0	8	33	1
Grey teal	0	3	0	0	0	0	0	0	0	0	2
Australasian shoveler	10	5	3	0	2	0	0	0	2	4	3
Black cormorant	0	1	0	0	0	0	0	0	0	0	0
Little cormorant	0	0	0	0	0	0	1	0	0	0	0
Little black cormorant	0	0	0	0	0	0	0	0	0	0	0
Swamp harrier	0	0	0	0	1	0	0	0	0	1	0
White-faced heron	0	0	0	0	1	1	0	0	1	0	0
Pukeko	8	8		31	11	7	8	9	6	21	8
SI pied oystercatcher	0	0	1	0	0	0	0	0	0	0	0
Spur-winged plover	2	4	0	4	0	0	6	6	2	4	2
Pied stilt	2	4	0	0	0	0	2	0	0	0	0
Black-backed gull	0	0	0	0	2	0	0	0	0	0	0
Black-billed gull	0	0	0	0	0	0	0	0	0	0	0
Caspian tern	0	0	0	0	0	0	0	0	0	0	0
NZ kingfisher	0	0	1	0	2	1	0	1	0	1	0
Welcome swallow	0	0	0	0	0	0	0	2	0	0	0
TOTAL	**64**	**40**	**18**	**63**	**21**	**17**	**38**	**40**	**27**	**78**	**35**

Andrew Crossland
ECOLOGIST/ORNITHOLOGIST
Parks Biodiversity Team
Parks & Asset Management
Christchurch City Council
PO Box 73011
Christchurch 8154

Phone: (03) 941 7571
Mobile: 027 434 1155
Email: \\

Photos: All A. Crossland, except © R. Crossland (little egret, falcon), © G. Bell (bittern)