

1 Objectives:

To identify by sight and sound all birds encountered from Waikawau Bay estuary mouth to the back of the Waikawau wetlands to the south - a distance of 2km.

2. Method: (See map Appendix Two and Site Descriptions and GPS Co-ordinates, Appendix One)

2.a Two transects were walked at the same time.

2.b The transects were one on each side of the outer estuary and continuing up along the wetland boundaries.

2.c Every 200m a 5 minute listen and visual count was carried out. Binoculars were used only to verify sightings made by the naked eye.

2.d All birds, seen and heard were recorded at each site, until the mid/back of the wetlands was reached.

2.e Ten sites were monitored by each recorder.

2.f The transects covered terrains from tidal mudflats, through salt marsh, pastureland, stream crossings, roadsides, exotic plantations, native bush margins and the freshwater wetlands proper.

2.g If possible annual surveys were carried out in April to coincide with a low tide around 9.00am in the middle of the month¹.

2.h The same two observers recorded all surveys².

2.i. Surveys were also carried out at five yearly intervals in early summer (December).

3 Results³: (See Appendix three)

3.1 Annual April Surveys.

3.1.1. Sites surveyed on 30 April 2009: (Start time 8.45 am; tide going out, - low tide). Wind affected – gusty in estuary.

- A total number of 272 birds were recorded in this survey.
- There were 28 species recorded.
- 19 species were native or endemic (68%) and 9 were exotic (32%).
- 187 of the birds recorded were native or endemic (68.74%) and 85 were exotic (31.24%).

¹ The timing was weather dependant and it was not always possible to undertake surveys on the scheduled date due to wind factors or heavy rain. For example, the 2016 survey was scheduled for 17 April. However, this date saw the biggest flood in the area in 37 years and so was deferred until 29 April 2016. No survey was carried out in 2010.

² K. Parr and W. Todd.

³ For sites One and two of each survey line (RS1-2 and LS1-2) there is some overlap of results, due to them being within visual proximity. Therefore there is some double counting from these sites. This overlap is factored into the results and therefore some of the final figures used in the tables, graphs and Results section of this document differ from the actual 'on the ground counts' found in the Appendices.

- There were more shore and wading birds seen feeding further up the estuary than in the December 2003 survey (see 3.2.1).
- A large flock of paradise shelducks was counted – significantly boosting the total number of birds counted.
- 16 fernbirds were seen or heard.

3.1.2 Sites surveyed on 29 May 2011: (Start time 9.30 am; Low tide 10.30am) Cool, overcast and breezy NW winds.

- A total number of 151 birds were recorded (well down on previous surveys).
- There were 26 species recorded.
- 19 species were native or endemic (65.5%) and 9 were exotic (34.5%).
- 109 of the birds were either native or endemic (76.2%) and 34 were exotic (23.8%). There were two new bird species recorded: black backed gull and little black shag.
- There were only a few paradise shelduck recorded (9). Flocking in the estuary tends to be earlier in the year and is usually at its height in April (before Duck shooting season).
- Fewer birds were seen or heard, along the Waikawau Bay road, and in the blackwoods, than in any other habitats (Sites RS 5, RS6 and RS7).
- There were 11 fernbirds seen or heard.

3.1.3 Sites surveyed on 17 April 2012: (Start time 9.20am; low tide 9.30) Warm, calm – slight SW winds.

- A total of 320 birds were seen or heard.
- There were 30 species recorded.
- A new species encountered was NZ wood pigeon.
- A large flock of paradise shelducks was again counted (74 in the estuary proper).
- 256 (80%) of birds were native or endemic and 64 (20%) of the birds counted were exotic.
- 8 of the birds encountered were fernbirds.
- Fewer birds were seen and heard in areas of exotic flora.

3.1.4 Sites surveyed on 23 April 2013: (Start time 9.00am; low tide 9.00) Warm, calm – slight SW winds.

- A total of 514 birds were seen or heard.
- A total of 35 species were seen or heard. 12, (34.5%) of these were exotic and 23, (65.6%) native or endemic.
- 28 of the birds were fernbirds (5.5% of all birds counted; 8.6% of native or endemic birds counted).
- There were 58 pateke counted.

- There were 76 paradise shelducks seen.
- Bird count numbers were low in the blackwoods.

3.1.5 Sites surveyed on 24 April 2014 (Start time 8.10am; low tide 8.00am). Warm, calm and some slight SW breezes.

- A total of 337 birds were seen or heard. Of these 106 were exotic (31.45%) and 231 were native or endemic (68.54%).
- A total of 31 species were encountered. Of these 12 were exotic and 19 were native or endemic.
- 27 fernbirds were heard or seen (8.1% of all birds encountered).
- Only 14 Paradise shell ducks were encountered.
- A royal spoon bill was seen feeding in the estuary.
- There was a banded rail sighted in the saltmarsh.
- Bird count numbers were lower in the blackwoods than in other habitats.

3.1.6 Sites surveyed on 15 April 2015 (Start time 9.00am; low tide 8.00am). Cool with steady SW winds.

- A total of 377 birds were seen or heard. 75 birds were exotic (19.9%) and 302 were native or endemic (80.1%).
- A total of 32 species were encountered. Of these 10 were exotic and 23 were native or endemic.
- 3 Caspian terns were seen.
- 13 fernbirds were heard
- 5 banded dotterels and 5 NZ dotterels were seen.
- Only 13 paradise shell ducks were encountered.
- Bird numbers in the blackwoods were lower than in other habitats.

3.1.7 Sites surveyed on 29 April 2016 (start time 8.00am; low tide 7.30am). Warm and calm with slight SW breezes.

- A total of 280birds were seen or heard. Of these 75 (26.78%) were exotic and 205 (73.21%) were native or endemic
- A total of 33 species were encountered. Of these 10 were exotic and 23 were native or endemic.
- 27 fernbirds were seen or heard.
- Only 11 paradise shelducks were encountered.
- 3 Caspian terns were seen
- A banded rail was heard.
- Bird counts were low in the blackwoods.

3.2 Five yearly December Surveys (2008 and 2013).

3.2.1 Sites surveyed 7 December 2008: (Start time 9.00am; mid tide). No weather conditions available.

- A total of 289 birds were recorded in the December survey.
- There were 34 species. Birds ranged from shorebirds to forest birds. Two significant species were seen. These were banded rail and fernbirds.
- A total of 22 species were either native or endemic (65%). These included: NZ pipit, fernbird, variable oystercatchers, Australasian gannet and shining cuckoo.
- 12 species were exotic (35%).
- Overall fewer birds were recorded in the blackwood plantations than in other habitat types.
- 172 birds were native (60%) or endemic and 117 were exotic (40%).
- 12 fernbirds were seen or heard.

3.2.2 Sites surveyed on 11 December 2013. (Start time 9.15am; low tide 8.30am).Mild, NW wind.

- 340 birds were encountered. 111 were exotic (32.65%) and 229 native or endemic (67.35%).
- A total of 36 species were observed. 13 of these were exotic and 23 native or endemic.
- 33 pateke were seen in the estuary.
- A banded rail was encountered.
- Shining cuckoos were heard.
- 19 fernbirds were heard.

4 Comparative data from the Five Minute Bird Surveys: April 2009, May 2011, April 2012 April 2013, April 2014, April 2015 and April 2016.

	April 2009	May 2011	April 2012	April 2013	April 2014	April 2015	April 2016
Total number of bird species	28	26	30	35	31	32	33
Total number of exotic species	9	9	8	12	12	10	10
% of exotic species	32*%	34.5*%	26.7%	34.3*%	39%	31.25%	30.30%
Total no of native or endemic species	19	17	22	23	19	22	23
% of native or endemic species	68.45*%	65.5*%	73.3%	65.6*%	61.3%	68.75%	69.69%
Total number of birds	272	143	320	514	337	377	280
Total number of exotic birds	85	34	64	199	106	75	75
% of exotic birds	31.24*%	23.77*%	20%	38.7*%	31.45%	19.9%	26.78%

Total number native/endemic birds	187	109	256	325	231	302	205
% of native or endemic birds	68.74%	76.22%	80%	63.2%*	68.54%	80.1%	73.21%

Table One

	Dec 2008	Dec 2013
Total number of bird species	34	36
Total number of exotic species	12	13
% of exotic species	35%*	36.1%
Total no of native or endemic species	22	23
% of native or endemic species	65%*	63.8%
Total number of birds	289	340
Total number of exotic birds	117	111
% of exotic birds	40%*	32.65%
Total number native/endemic birds	172	229
% of native or endemic birds	60%*	67.35%

Table Two

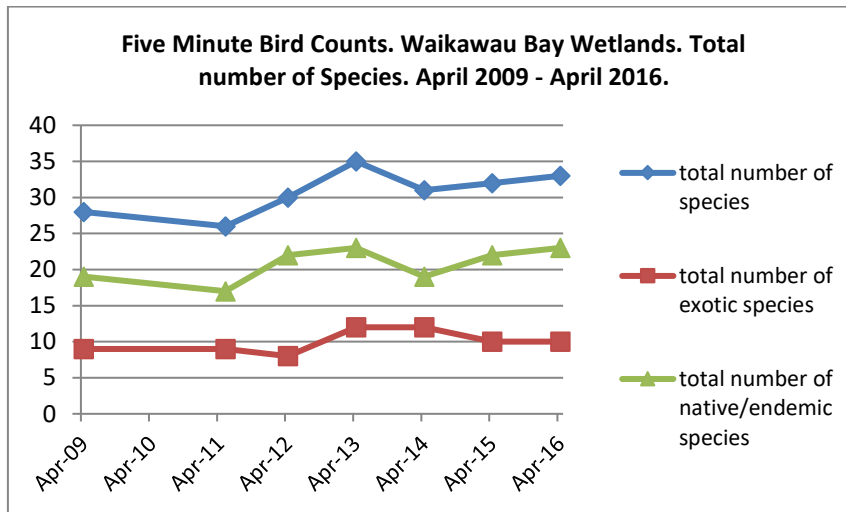


Figure One

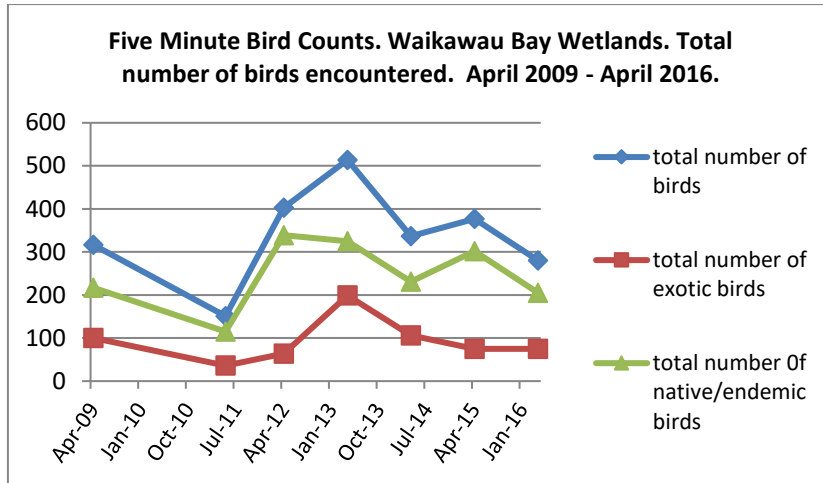


Figure Two

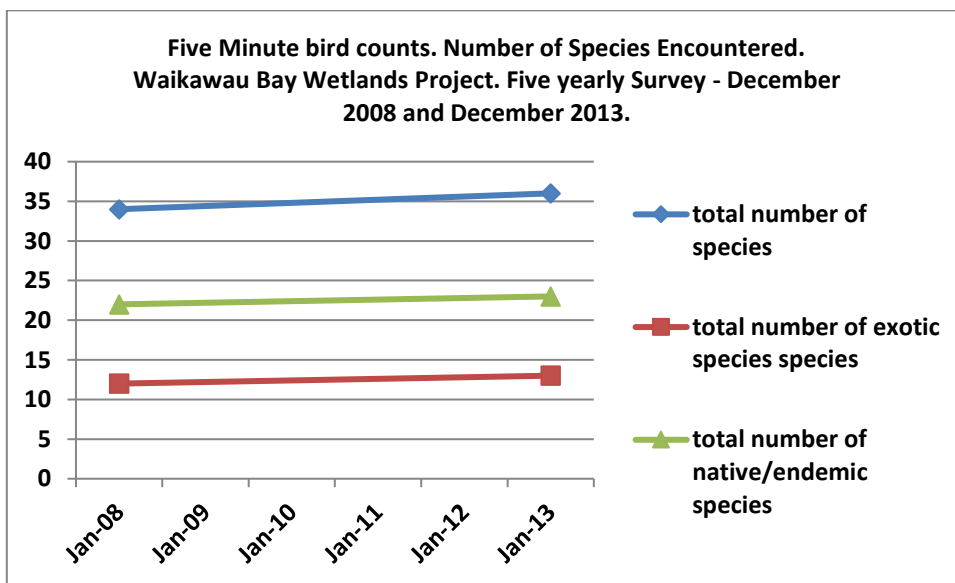


Figure Three

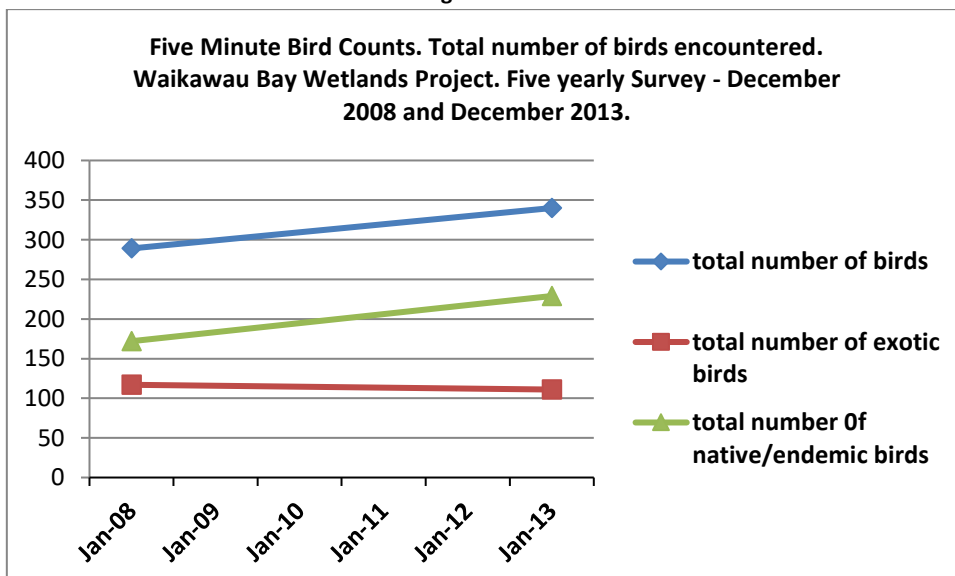


Figure Four

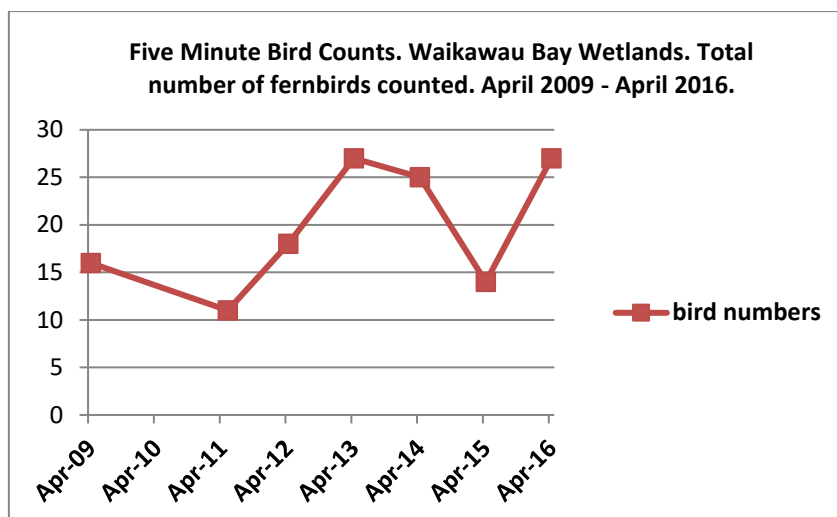


Figure five

5 Discussion:

A considerable number of habitat types were traversed in the course of the surveys. Accordingly, a large variety of birds were encountered in all surveys, from shore and wading birds to forest, stream, marsh and pasture birds.

The different times of the year, of the surveys, have (predictably), produced variable results. The early summer survey of 2008 and 2013 produced some different species of birds seen or heard to those seen or heard in April 2009, 2012, 2013, 2014, 2015, and 2016.

5.1 Notes about April (and May) Surveys:

5.1.1 The late May survey of 2011 sited far fewer birds than other surveys. It is thought that this is because winter bird life in the estuary, pasture, saltmarsh, swamp and coastal forest is less than in the rest of the year, with many birds moving further inland, further up the coast, “hunkering down” for winter, or migrating to warmer climates. For example, fewer fernbirds were encountered in this survey (11). In addition fewer duck numbers were observed.

5.1.2. Flocking takes place around April and could account for larger numbers of paradise shelducks being seen in the April 2009, 2012 and 2013 surveys. The May 2011 survey was at the end of the shooting season when ducks would have been culled or scared by gunshots. Surveys in 2014, 2015 and 2016 saw few paradise shelducks during the survey time, however, flock sizes of around 70+ were seen each of these years (on survey days) in pastureland alongside the estuary (the preferred habitat of this species).

5.1.3 Flocks of paradise shelducks and pateke were present in high numbers in the estuary in the 2013 survey. Yellow hammer, and finch flock numbers were also high (around 100 birds), in this year, accounting for the total number of birds seen, being much greater than in all other years of the surveys.

5.2 Notes about December Surveys:

5.2.1 There were shining cuckoos encountered and also more skylarks than at other survey times.

5.2.2 Overall, numbers of native/endemic birds and species, appear to have climbed during this time. Of note is the small decline in the number of exotic birds encountered against the noticeable increase in native and/endemic numbers.

5.3 Other Observations:

5.3.1 Overall, there was fewer birds encountered in non native vegetation and along the Waikawau Bay main road (see also point 5.3.2).

5.3.2 On balance the numbers of exotic birds versus native/endemic birds, in the Waikawau Bay wetland system, appears to be changing over time. It may be possible to attribute some of this to the changes occurring in the flora of the wetland system, as well as control of pest species.

There is intensive animal pest control that is being done in the area. Mustelids, cats, possums and rodents are all being targeted. Additionally, the targeting of hedgehogs has been escalated. Hedgehogs are not commonly a focus in pest control, but in Waikawau Bay this has been a feature of the pest control in and around the dune system for about 15 years. This has been done, in order to protect the breeding of variable oyster catcher's, banded dotterels and New Zealand dotterels. More recently, this trapping regime has been extended in order to protect other vulnerable species, such as fernbirds. As such, many mustelids traps in the lowland areas of the catchment, along roadsides, etc, have now had their entrances enlarged in order to trap hedgehogs.

Another factor which could be contributing to the change in balance of exotic versus native or endemic bird numbers, could be to do with the control of plant weed species within both the freshwater wetlands and the estuarine system. Saltwater paspalum, pampas and spartina are all the focus of intensive control within the estuary. Willows, woolly nightshade, moth plant, and pampas are all subjects to control in the freshwater system. Almost all willows are dead, woolly nightshade is also largely gone (although needs constant work), pampas control has begun and considerable work has been carried out on moth plant. In addition, replanting with natives, on areas of weed control began in 2009 and is added to annually. With natural habitat restoration, it is assumed that native bird species find appropriate food and shelter which encourages their numbers to increase.

5.3.3. Flocking of both exotic native species more noticeable in the last three/four years of April surveys. Those first noticed, were the yellow hammers and finches, this began in 2012 but was particularly noticeable in 2013 when approximately 100 of these birds were seen or heard. Numbers were again high in 2014. 2014 was a year in which a large number of flora species had high flower and fruit yields. In the years 2015 and 2016 there were many small flocks of wax eyes and grey warblers replacing the small exotic seed feeders and insectivores of the previous surveys (finches and yellow hammers eat some insects although are mostly seed feeders),. Wax eyes inhabit most habitat types (except tussock) and feed on a wide range of foods; insects, nectar and fruits. Grey warblers require a more sheltered habitat with bush or scrub cover and feed primarily on insects. The fact that there are more flocks of both warblers and wax eyes may indicate greater numbers of insects (it may also be that 2016 was another high flower/fruit year and thus there was more abundant fauna).

5.3.4 It is encouraging that fernbird numbers have generally be seen to be rising with 12 in the first survey and 27-28 in the more recent surveys. However, a cautionary note should be added here; fernbirds are mainly insectivores. The large number of Asian paper wasps and common wasp nests found in and around the salt marsh and swamp is therefore of concern, since wasps and birds are therefore in direct competition for the same food sources. Parker notes that "if competition with Asian paper wasps for invertebrates is occurring, North Island fernbird may require larger territories to obtain food, particularly when feeding young."⁴

Fernbird surveys done annually in the Waikawau Bay Wetlands between the years 2006 and 2013⁵ indicate that the wetland area may have reached capacity around 2010/2011 and that the young of this species has been moving into outlier areas. This being the case, a steady number of 27 -28 birds sited or heard during many surveys may be indicative of the "abundance" likely to be encountered during such surveys and may not likely increase markedly over time.

⁴ cit op. pp. 45.

⁵ See K. Parr Waikawau Bay Wetlands Fernbird Report 2016.

Waikawau Bay Wetlands Fernbird Survey Counts 2006 - 2013

	2007	2008	2009	2010	2011	2012	2013
Total bird counted and number of sites surveyed	20 (4 sites)	78 (16 sites)	85 (16 sites)	110 (15 sites)	121 (15 sites)	111 (16 sites)	128 (15 sites)

Table Three



Paper wasp nest (Waikawau Wetlands saltmarsh).

Fernbird (Waikawau Wetlands 2013).

5.3.5 Pateke numbers in the Waikawau Bay wetland area have risen from around 17 in 2007 to approximately 212 in 2015.⁶ It is encouraging to see these ducks feeding in the estuary on some occasions during the surveys and on one occasion numbering 58 ducks (2013 survey).

5.3.5 With increasing numbers of several species and the large variation of species seen the assumption can be made that the biodiversity of this catchment from hilltop to seashore is rich, healthy and varied. Other studies carried out in the wetland system show that all native freshwater fish species that should be present, are⁷. And although no surveys on freshwater fish abundance have as yet been done in the Waikawau wetlands, it is the observation of local ecologist that there are good numbers of such species in the catchment⁸. Cockle counts are high, although species sizes is not large.⁹ These features of the Waikawau Bay ecology are indicators of good water quality.

4 Conclusions:

4.1 There is a very good representative number of bird species throughout the area and some, such as the fernbird, bittern¹⁰, banded rail, banded dotterel and NZ dotterel, have small, but healthy populations.

4.2 There is considerable and comprehensive predator control in the area and the surrounding catchment. This may be contributing to the rise in numbers of some exotic and native bird species, in particular the flocks of small passerines.

4.3 Many weed pest species are being controlled in the Waikawau Bay wetland and replanting of native plant species has been underway since 2007?. The change in flora may be influencing the rise in native and endemic birds encountered and the decline in exotics.

4.4 Given the diversity and abundance of bird species, and that all common and some endangered species appear to be doing well, an assumption can be made that the physical environment is generally healthy.

⁶ See K. Parr. Waikawau Bay Wetlands Pateke Report, 2016.

⁷ K. Parr and W. Todd, Freshwater fish Surveys Waikawau Bay 2008.

⁸ Gerry Kessells, pers. Comment. K. Parr and W. Todd pers. comment.

⁹ K. Parr and W. Todd. Shellfish Surveys, Waikawau Bay Estuary 2009.

¹⁰ Known in the area, but not encountered in the Five Minute Birds Surveys.

5 Recommendations:

5.1 To continue to carry out surveys, annually in April at low tide, at approximately 9.00 am.

5.2 To continue to survey every five years in December.

5.3. To use data collected to monitor climatic impacts, the success (or otherwise) of restoration efforts (weed control, replanting and predator control) and to assist with the ongoing planning in terms of the Wetlands Three Year Management Plans¹¹.

5.4 To note features about climatic conditions during the year and additional information about food abundance for those years and include this information in reports so as to enhance speculation about trends relevant to the restoration of the Waikawau Bay wetland.



Pied stilts feeding, in the Waikawau Bay Estuary (April 2009), and black and pied shags, in main Waikawau stream, near Waimanu Road Bridge (April 2009).

References

Hansford, D and Daly, P. 2010. Wetlands. New Zealand Geographic, Jan/Feb 2010.

Gill, B. 2000. The Ancestry of Birds. Forest and Bird. Number 295, February 2000.

Moon, L. 2006. Know your New Zealand Birds. New Holland.

Parker, K. 2002. Ecology and Management of North Island Fernbird (*Bowdleria punctata vealeae*) MSc, University of Auckland.

Reader's Digest. 1985. Complete Book of New Zealand Birds. Reed Methuen.

¹¹ Management Plan for Waikawau Wetlands June 2015 to June 2018, available on request from Project Manager for MEG Wetlands.

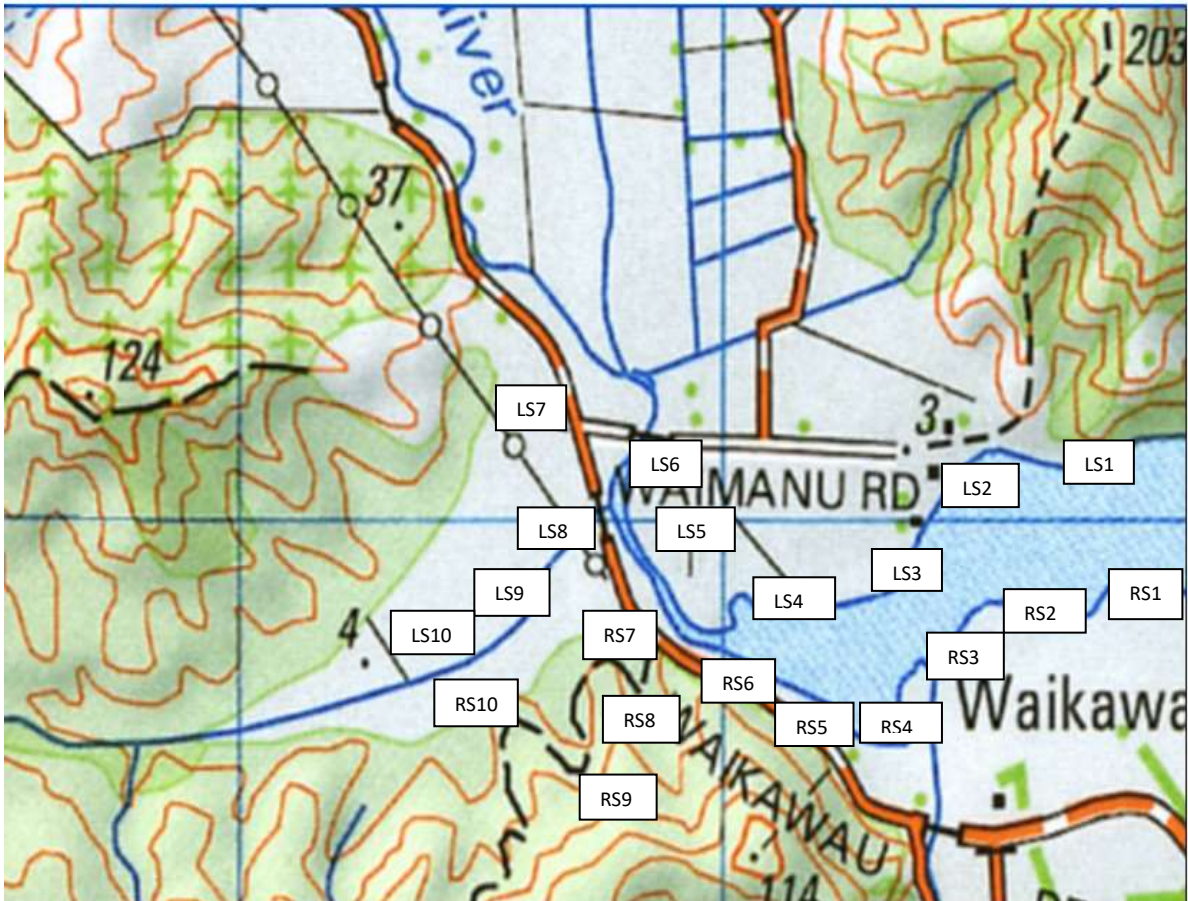
**Five Minute Bird Counts
Appendix One.
GPS Coordinates, Site Description and Keys.**

Site number	Site description	GPS	Site key
One (RS1)	<u>Right side estuary mouth:</u> Airstrip paddock. Tidal mudflats, dune margins. Pastureland.	E2735826 N6508892	RS1
Two (RS2)	Estuary, tidal mudflats Waikanae stream junction with Waimanu stream. Pastureland and salt marsh. Old spartina patch.	E2735179 N6508809	RS2
Three (RS3)	Tidal mudflats, mangroves, gorse and pampas Meeting of Waikanae Valley stream and Waikawau stream.	E2735498 N6508820	RS3
Four (RS4)	Road edge. gorse, pampas, at baitstation on small macrocarpa	E2735359 N6508683	RS4
Five (RS5)	Road edge overlooking Waikawau stream between pohutakawa and Benton gate. Mangroves and reeds.	E2735175 N6508648	RS5
Six (RS6)	Blackwoods, kahikatea, totora. Turn off to TAD line.	E2734995 N6508749	RS6
Seven (RS7)	Blackwoods and kanuka. Ben rat 15.	E2734810 N6508694	RS7
Eight (RS8)	Kanuka, manuka, gorse, scrub. Ben rat 25.	E2734672 N6508689	RS8
Nine (RS9)	Kanuka, manuka, gorse, pampas. Ben rat monitor 6.	E2734658 N6508553	RS9
Ten (RS10)	Kanuka, pampas and scrub. Overlooking wetland of reeds, cabbage trees, raupo and flax. TAD 58.	E2734517 N6508606	RS10
Eleven (LS1)	<u>Left side estuary mouth:</u> Knox Cottage. Tidal mudflats, paspalum and pastureland.	E2735511 N6509101	LS1
Twelve (LS2)	Near Sandy and Erica's garden shed. Tidal mudflats paspalum and pastureland.	E2735396 N6508961	LS2
Thirteen (LS3)	Middle of tidal flat, old fence post, baitstation. Mangroves, paspalum.	E2735238 N6508806	LS3
Fourteen (LS4)	DOR rat line, monitor station 4 Pampas, oioi, ribbonwood	E2735065 N6508836	LS4
Fifteen (LS5)	DOR rat line. Coastal tree daisy, oioi, ribbonwood, kanuka.	E2734928 N6508933	LS5
Sixteen (LS6)	DOR rat line. Pampas, ribbonwood, oioi,	E2734826 N6509069	LS6
Seventeen (LS7)	Corner Waimanu Rd and Waikawau Bay Rd. pastureland, pampas, riverbank.	E2734709 N6509138	LS7
Eighteen (LS8)	Leo's driveway, LEO 3 rat box. streambank, Pampas, woolly nightshade, pastureland, reeds kanuka.	E2734713 N6508964	LS8
Nineteen (LS9)	Between Leo 10 and 11. Stream bank, pampas, pastureland, kanuka, woolly nightshade.	E2734600 N6508816	LS9
Twenty (LS10)	LEO 12. Streambank. Pastureland, reeds, pampas, kanuka, woolly nightshade	E2734413 N6508729	LS10

Appendix Two

Map of Five Minute Bird Count Sites

Waikawau Bay Wetland Project



Five Minute Bird Counts Appendix Three

Results: 7 December 2008:

Site key	Bird species	Number of birds	Seen or heard
RS1 Site 1	NZ pipit	1	S
	skylark	1	S
	fernbird	1	S
	variable oyster catcher	4	S
	yellowhammer	1	S
	bellbird	3	S
	pieb shag	1	S
	magpie	3	S&H
	starling	1	H
RS2 Site 2	pieb stilt	1	H&S
	variable oyster catcher	1	
	NZ pipit	1	S
	skylark	2	S&H
	mynah	1	H
	magpie	3	S
	welcome swallow	1	S
	greenfinch	2	S
	spurwinged plover	1	S
RS3 Site 3	paradise shelduck	15	S
	pieb stilt	3	S
	grey duck	2	S
	white faced heron	1	S
	magpie	2	S&H
	spurwinged plover	2	H
	kingfisher	1	H
	welcome swallow	2	S
	mynah	4	S
	bellbird	1	H
	tui	1	H
RS4 Site 4	kingfisher	1	H
	mynah	2	H
	greenfinch	1	H
	bellbird	1	H
	yellowhammer	1	H
	thrush	1	H
	pheasant	1	H
RS5 Site 5	kingfisher	1	H
	bellbird	1	H
	mynah	1	H
	blackbird	1	H
	pieb stilt	1	H
	pukeko	2	H
	Australian gannet	1	S
	yellow hammer	4	S
	fernbird	1	H
	Australasian harrier hawk	1	S
	spur winged plover	2	H
paradise shelduck	2	S	
RS6 Site6	fernbird	3	H
	blackbird	1	H
	tui	1	H
	kingfisher	1	S
	shining cuckoo	1	H
	banded rail	1	H
	mynah	2	S
	bellbird	1	H
	chaffinch	1	H
RS7 Site 7	mynah	2	H
	tui	2	H
	kingfisher	3	H
	chaffinch	1	S
RS8 Site 8	grey warbler	1	H
	tui	2	H
	mynah	5	H
	bellbird	1	H

	blackbird	2	S&H
	yellowhammer	1	H
RS9 Site 9	chaffinch	1	H
	bellbird	2	H
	mynah	1	H
	tui	2	H
	blackbird	3	H
	wax eye	1	H
RS10 Site 10	Californian quail	1	H
	tui	2	H
	bellbird	3	H
	chaffinch	3	S&H
	greenfinch	1	H
	pheasant	1	H
	fantail	2	S&H
	wax eye	2	S&H
	blackbird	1	H
	magpie	1	H
LS1 Site 11	magpie	2	S&H
	blackbird	3	S&H
	welcome swallow	1	H
	NZ pipit	2	H
	grey warbler	2	H
	thrush	2	H
	kingfisher	2	S&H
LS2 Site 12	NZ pipit	3+	H
	welcome swallow	1	H
	kingfisher	2	H
	pheasant	1	H
	blackbird	1	H
	mynah	4	S&H
	starling	3	S&H
	paradise shelduck	1	H
	skylark	3	H
LS3 Site 13	paradise shelduck	3	S
	fernbird	3	H
	variable oyster catcher	1	H
	mallard duck	2	S
	magpie	2	H
	kingfisher	1	H
	blackbird	1	H
	tui	2	H
	chaffinch	1	H
	NZ pipit	1	H
	white faced heron	1	S
LS4 Site 14	tui	2	H
	mallard duck	3	S&H
	magpie	2	H
	blackbird	2	H
	fernbird	1	H
	grey warbler	2	H
	yellowhammer	1	H
	NZ pipit	1	H
	chaffinch	1	H
	wax eye	1	H
	kingfisher	2	S&H
LS5 Site 15	grey warbler	1	H
	magpie	1	H
	fernbird	2	H
	thrush	1	H
	kingfisher	2	H
	chaffinch	1	H
	yellowhammer	3+	H
	bellbird	1	H
LS6 Site 16	fernbird	2	H
	bellbird	1	H
	grey warbler	2	H
	thrush	2	H
	tui	1	H
	welcome swallow	3	S&H
	yellow hammer	3	S&H
	fantail	2	S&H
LS7 Site 17	bellbird	1	H
	fantail	2	H
	wax eye	1	H

	kingfisher	1	H
	spurwinged plover	2	H
LS8 Site 18	fernbird	2	H
	skylark	3	S&H
	kingfisher	3	S&H
	tui	2	H
	mynah	1	H
	fantail	2	S&H
LS9 Site 19	grey warbler	2	S&H
	kingfisher	1	H
	spurwinged plover	1	H
	bellbird	1	H
	welcome swallow	1	H
	tui	1	H
	mynah	3	S&H
	fantail	3	S&H
	skylark	4	S&H
LS10 Site 20	grey warbler	2	H
	kingfisher	1	H
	skylark	2	H
	yellow hammer	3	S&H
	tui	2	H
	mynah	1	H
	welcome swallow	1	H
	fantail	1	H
	eastern rosella	1	S

30 April 2009

Start time: 0845 am

Site key	Bird Species	Number of Birds	Seen or Heard	Weather Conditions
RS1 Site 1	banded dotterel	1	S	Gusty Up to 20kts
	bellbird	12	H&S	
	myna	3	S	
	NZ pipit	5	H&S	
	red billed gull	4	S	
	variable oystercatcher	1	S	
	pieb shag	2	S	
	pieb stilt	2	S	
	welcome swallow	1	S	
RS2 Site 2	Australasian harrier hawk	1	S	Wind affected 20-30kt gusts
	green finch	2	S	
	mallards	2	S	
	myna	4	S	
	paradise shelduck	30	S	
	red billed gull	4	S	
	variable oystercatcher	3	S	
	white-faced heron	1	S	
RS3 Site 3	bellbird	1	H	Wind affected 10-20kts
	Caspian tern	1	S	
	magpie	1	H	
	myna	3	H&S	
	paradise shelduck	3	H&S	
	red billed gull	2	H&S	
	welcome swallow	2	S	
RS4 Site 4	Australasian harrier hawk	1	S	Wind affected 10-20kts
	kingfisher	1	S	
	magpie	2	H	
	mallard	4	S	
	myna	1	H	
	tui	1	H	
	white faced heron	1	S	
RS5 Site 5	bellbird	2	H	
	chaffinch	12	S	
	magpie	1	S	
	red billed gull	1	S	
	tui	1	H	
RS6 Site6	bellbird	1	H	Wind affected 20-30kts Tree noise
	fernbird	1	H	
	grey warbler	2	S	
	myna	1	H	

	paradise shelduck wax eye tui	1 2 1	H H H	
RS7 Site 7	bellbird fantail grey warbler wax eye tui	1 4 1 2 1	H H&S H&S H H	No wind
RS8 Site 8	bellbird fantail magpie wax eye thrush	1 1 2+ 1 1	H H&S H H H	Wind affected 0-20kts Tree noise
RS9 Site 9	bellbird fantails wax eye	1 1 1	H H H	No wind
RS10 Site 10	bellbird blackbird chaffinch hawk magpie wax eye tui	2 1 1 1 1 1 1	H H H S H H S	No wind Finish= 1020am
LS1 Site 11	Caspian tern mallard mynah paradise shelduck pied stilt red billed gull sparrows variable oystercatcher	1 4 3 30 1 1 8 2	H&S H&S H&S S H&S H&S H&S S	Light wind
LS2 Site 12	chaffinch kingfisher pied stilt sparrows variable oystercatcher welcome swallow	1 1 6 5+ 1 5	H&S S S H&S S S	Light wind
LS3 Site 13	Caspian tern magpie mallard mynah red billed gull sparrows white faced heron	1 1 3 2+ 3 2+ 1	S H H&S H S H S	No wind
LS4 Site 14	chaffinch fernbird Australasian harrier hawk mynah wax eye white faced heron	1 3 1 2+ 4 1	H H S H H&S S	No wind
LS5 Site 15	chaffinch fernbird kingfisher wax eye sparrow welcome swallow	1 2 1 2 2+ 2	S S S H H S	Light wind
LS6 Site 16	bellbird Caspian tern paradise shelduck pukeko skylark welcome swallow	1 2 2 2 6 1	H S H&S S H&S S	
LS7 Site 17	bellbird fantail fernbird pukeko skylark welcome swallow	1 3 2 1 3 3	H H&S H&S H H&S S	
LS8 Site 18	bellbird eastern rosella fantail fernbird grey warbler Australasian harrier hawk kingfisher	1 1 1 4 1 1 2	H S H S H S S	

	mynah wax eye	1 2+	S H	
LS9 Site 19	bellbird fantail fernbird kingfisher wax eye white faced heron	1 1 4 2 2+ 1	H H H&S S H S	
LS10 Site 20	bellbird blackbird fantail mynah wax eye skylark welcome swallow	1 1 2 1 2+ 1 1	H H H S H S S	

29 May, 2011.

Start time 9.30 am Low tide 10.30 am

Site key	Bird species	Number of birds	Seen or heard	Weather conditions and other notes
RS1 Site 1	variable oyster catcher Harrier hawk Kingfisher tui mynah swallow	1 4 1 1 1 1	S S S H S S	Light NW breeze Overcast Cool
RS2 Site 2	ped stilt variable oyster catcher white faced heron goldfinch paradise shelduck Yellowhammer	2 2 1 7 6 1	S S S S&H S+H S	As above
RS3 Site 3	kingfisher thrush Californian quail mynah mallard tui	1 2 1 3 1 1	S H H S S S	Cool and breezy
RS4 Site 4	bellbird magpie	1 1	H H	Breezy
RS5 Site 5	little black shag magpie paradise shelduck kingfisher blackbird	1 1 7 1 1	S H S+H S H	Strong S-SW breeze. Slight noise
RS6 Site6		0		Slight wind
RS7 Site 7	fernbird	1	H	Breezy Some noise
RS8 Site 8	bellbird blackbird	1 1	H H	
RS9 Site 9	bellbird	4	H	Slight breeze Chainsaw noise
RS10 Site 10	bellbird	4	H	Slight breeze Plane overhead
LS1 Site 11	Australasian gannet blackbird welcome swallow grey warbler harrier Hawk black backed gull kingfisher ped stilt VOCs paradise shelduck white faced heron	1 1 1 1 1 1 1 4 8 1 1	S H S H S S S S S H S	Calm. overcast
LS2 Site 12	kingfisher VOCs paradise shelduck	1 1 4	S S S	

RS5	blackbird bellbird welcome swallow tui spur-wing plover wax eye	1 1 1 1 25+ 5	H H S H S S	As above.
RS6	Eastern rosella bellbird mynah kingfisher	2 2 5 1	H H H S	Light breeze Occasional cars.
RS7	fantail grey warbler Australasian harrier hawk blackbird	1 2 1 1	H S S S	Light SW breeze Some tree noise.
RS8	grey warblers bellbird tui chaffinch	2 1 2 1	S H H H	Cooler
RS9	Australasian harrier hawk bellbird blackbird fernbird	1 4 2 3	S H H H	Breezy SW
RS10	wax eye bellbird tui magpie	3 2 1 1	S H H H	Light SW breeze
LS1	pied stilt Caspian tern VOC mynah pied shag white faced heron paradise ducks spur-winged plover	3 2 2 2 2 1 62 2	S S S =H S S S S S	Calm slight SW wind
LS2	pied stilt welcome swallow	3 4	S S	As above.
LS3	Tui Spur-wing plover Green finch finch grey warbler	3 2 1 5+ 2	S+H H H H H	Stronger SW wind.
LS4	grey warbler fernbird spur-wing plover kingfisher pied shag tui	2 4 1 1 1 2	H H H H S H	Slight SW wind. rustling of pampas and reeds.
LS5	grey warbler fernbird wax eye tui blackbird	3 1 4 1 1	H H H H H	Slight SW breeze..
LS6	pied shag welcome swallow fantail	1 2 2	S S&H H	Slight wind noise in pampas.
LS7	grey warbler welcome swallow Australasian harrier hawk spur-wing plover fernbird fantail sparrow mynah pukeko green finch	10 2 1 1 2 1 1 1 3 1 1	S H S S H H S S+H S H	Slight breeze.
LS8	fernbird green finch fantail grey warbler Eastern Rosella tui wax eye	4 2 2 1 1 1 2	H H H H H H H	Calm, warm.
LS9	grey warbler fernbird	1 1	H H	Wind in pampas

	magpie	1	S	
	bellbird	2	S&H	
LS10	grey warbler	1	H	Clouded over. Wind in pampas.
	chaffinch	2	H	
	fernbird	3	H	
	wax eye	3	H	
	wood pigeon	1	S	

23 April, 2013.

Start time 9.00 am Low tide 9.00 am

Site key	Bird species	Number of birds	Seen or heard	Weather conditions and other notes	
RS1	variable oyster catcher	3	S	Cloudy warm still.	
	black back gulls	4	S		
	Caspian terns	2	S		
	swallows	5	s		
	pieb stilt	5	S		
	pieb shag	4	S		
	finches	2	S		
	yellow hammer	2	S +H		
	White faced heron	1	S		
	tui	1	S		
	pateke	58	S		
	paradise shelduck	59	S		
	mynah	5	S+H		
	mallard	1	S		
	grey warbler	2	H		
	kingfisher	1	S		
	spur wing plover	5	S		
	sparrow	3+	H		
RS2	pieb stilt	1	S	Slight SW breeze	
	mallard	2	S		
	welcome swallow	4	S		
	mynah	4	S		
	finch (gold?)	2	H		
RS3	fernbird	4	H	As above	
	sparrows	2+	H		
	grey warbler	1	H		
	yellow Hammer	4	S		
	blackbird	1	H		
	white faced heron	1	H		
RS4	fernbird	4	H	SW wind.	
	mynah	2+	H		
	spur wing plover	1+	H		
	paradise shelduck	1	H		
	kingfisher	1	H		
RS5	Australasian harrier hawk	1	S	As above.	
	bellbird	1	H		
	yellow hammer/finches	4+	S		
	tui	1	H		
	wax eye	5	S		
	kingfisher	1	H		
RS6	fantail	2	S	Still.	
	yellow hammer	1	S		
	little black shag	1	1		
	wax eye	2+	H		
	fernbird	1	H		
	grey warbler	1	H		
RS7	fantail	2	H		Still
	grey warbler	2	H		
	wax eye	2+	H		
	fernbird	2	H		
	welcome swallow	2	S		
	mynah	1	H		
	tui	1	H		
RS8	fernbird	5	S+H	Pampas rustling	
	fantail	1	H		
	blackbird	1	H		
	tui	1	S		

	finch grey warble welcome swallow wax eye	2+ 1 1 2+	H H S H	
RS9	Australasian harrier hawk pukeko paradise shelduck magpie fernbird blackbird yellow hammer mynah welcome swallow grey warbler kingfisher	1 7 9 1 3 1 3 2 1 1 2	S S S H H H S S S H S	As above
RS10	wax eye skylark sparrow yellow hammer fernbird fantail	2 1 2 5+ 1 1	H S H H H H	Light SW breeze
LS1	pieb stilt Caspian tern VOC mallard pieb shag white faced heron paradise ducks spur-winged plover welcome swallow Australasian harrier hawk black backed gull little black shag gold finch banded dotterel	5 2 2 15 5 1 74 2 3 1 1 1 10 2	S S S S S S S S ? ? ? ? ?	?
LS2	tui welcome swallow Australasian harrier hawk green finch gold finch starling fernbird kingfisher	1 4 2 3 16 9 1 1	? ? S ? ? ? ? ?	?.
LS3	mallard paradise shelduck Australasian hawk green finch gold finch white faced heron welcome swallow starling mynah magpie	7 1 1 16 24 1 3 11 4 5	S S S S ? ? S S S	Slight SW breeze.
LS4	tui Australasian harrier hawk fantail gold finch black bird mynah magpie	1 1 1 1 1 2 1	H? S ? S H ? ?	As above
LS5	bellbird fernbird wax eye chaffinch goldfinch mynah fantail tui blackbird	2 1 2 1 8 1 1 1 1	? H ? H S	?.
LS6	tui fantail bellbird grey warbler magpie pukeko	1 3 2 2 1 1	? ?	?.

	fernbird	1		
	little black shag	1		
LS7	fernbird	4	S	Slight SW breeze.
	green finch	2		
	fantail	1		
	grey warbler	2		
	chaffinch	1		
	bellbird	1		
	wax eye	3		
LS8	kingfisher	1	S	As above
	Australasian harrier hawk	1	S	
LS9	blackbird	2		
	pukeko	2		
	pheasant	1		
	kingfisher	1		
	bellbird	1		
LS10	tui	2		Slight SW breeze
	bellbird	3		
	chaffinch	3		
	blackbird	1		
	fernbird	1		
	wax eye	2		
	thrush	1		

11 December, 2013.

Start time 9.15 am Low tide 8.30 am

Site key	Bird species	Number of birds	Seen or heard	Weather conditions and other notes
RS1	variable oyster catcher	8	S	
	pieb stilt	2	S	
	paradise shell duck	1	S	
	NZ dotterels	4	S	
	bellbird	1	H	
	tui	1	S	
	white faced heron	1	S	
	kingfisher	1	S	
	skylark	1	S	
	spur winged plover	1	?	
	welcome swallow	1	S	
	RS2	spur winged plover?	11	
VOC		1	S	
mallard		1	S	
pateke		33	S	
NZ dotterel		2	S	
magpie		6	H	
pukeko		1	H	
bellbird		1	H	
tui		1	H	
kingfisher	1	S		
RS3	white faced heron	1	S	
	tui	2	H	
	welcome swallow	1	s	
	yellow hammer	2	H	
	mynah	1	H	
	skylark	1	S	
RS4	chaffinch	1	H	
	Australasian harrier hawk	1	S	
	mynah	2	H	
	bellbird	1	H	
	tui	2	H	
	black bird	1	H	
	magpie	2	H	
	fantail	1	?	
	thrush	1	H	
	green finch	1	?	
	RS5	kereru wood pigeon	1	
mynah		2	H	
Eastern rosella		1	H	
tui		1	H	

	Green finch fantail	1 1	? ?	
RS6	grey duck fantail fernbirdk kingfisher blackbird chaffinch	4 1 2 1 1 1	? S S S H ?	
RS7	shining cuckoo grey warbler chaffinch fantail bellbird tui blackbird	1 1 4 1 2 2 1	H H H H S H ?	
RS8	bellbird fantail blackbird Tui kingfisher pheasant	1 1 2 3 2 2	H H H S+H S H	
RS9	green finch chaffinch bellbird tui grey Warbler	1 3 1 1 1	H ? H H H	
RS10	magpie blackbird bellbird tui yellow hammer chaffinch	1 1 3 2 2 1	H H H H H H	
LS1	mallard blackbird VOC NZ dotterel little black shag black shag white faced heron paradise shell duck spur-winged plover chaffinch skylark pied stilt pateke	4 3 6 3 1 1 1 29 31 2 2 2 2 16	S S S S S S S S ? H H S S	Mild wind from NW
LS2	thrush welcome swallow kingfisher sparrow green finch fernbird blackbird skylark	1 1 1 3+ 1 1 1 2	H S S H H H H S+H	Windy from NW
LS3	spur wing plover pheasant green finch? gold finch magpie yellow hammer sparrow	2+ 1 2+ 2+ 2 2 1	S H S S H H H	
LS4	shining cuckoo fernbird yellow hammer bellbird grey warbler kingfisher	1 2 2+ 1 2 1	H? H H H H S	
LS5	bellbird fernbird shining cuckoo yellow hammer grey warbler kingfisher	1 2 1 2+ 2 1	H H H H H S	
LS6	tui green finch bellbird	3 3 2	H H H	NW wind in pampas

	grey warbler	1	H	
	thrush	1	H	
	Eastern rosella	1	H	
	fernbird	4	H	
	yellow hammer	2	H	
	magpie	2	S+H	
LS7	skylark	4	H	
	Caspian tern	1	S	
	magpie	2	H	
	chaffinch	2	H	
	green finch	1	H	
	banded rail	1	H	
	fernbird	2	H	
	welcome swallow	1	S	
	pheasant	1	H	
LS8	green finch	1	S+H	NW wind !!!
	yellow hammer	1	S+H	
	tui	1	H	
	grey warbler	2	H	
	bellbird	1	H	
	fernbird	1	H	
	pheasant	2	H	
	skylark	Many, 8+	S+H	
	welcome swallow	3+	S	
LS9	fernbird	2	S+H	Pampas and wind interference.
	skylark	3+	S+H	
	welcome swallow	3+	S	
	grey warbler	2	H	
	yellow hammer	2	H	
	bellbird	1	H	
	tui	1	H	
LS10	fantail	2	H	Very windy from NW and pampas noise.
	tui	2	H	
	grey warbler	1	H	
	fernbird	2	H	
	wax eye	2	H	
	pukeko	1	H	

24 April, 2014.

Start time 8.10 am Low tide 8.00 am

Site key	Bird species	Number of birds	Seen or heard	Weather conditions and other notes
RS1	variable oyster catcher	2	S	Calm
	pied stilt	1	S	
	banded dotterels	1	S	
	green finch	5	S	
	pied shag	3	S	
	welcome swallow	1	S	
	yellow hammer	1	H	
	royal spoonbill	1	S	
RS2	mallard	2	S	
	VOC	3	S	
	pied stilt	3	S	
	pied shag	1	S	
	red billed gull	2	S	
	tui	2	H	
	mynah	1	H	
	welcome swallow	2	S	
	paradise shelduck	36	S	
	kingfisher	1	S	
RS3	magpie	3	H	Calm
	paradise shelduck	2	S	
	mynah	2	H	
	welcome swallow	3	H	
	bellbird	1	H	
	greenfinch	9	S	
RS4	tui	3	H & S	Calm
	mynah	2	H	
	fantail	1	H	

	Australasian harrier hawk banded rail magpie fernbird grey warbler	2 1 1 3 1	S H H H H	
RS5	mynah tui white faced Heron	1 2 2	H H S	Calm
RS6	bellbird tui magpie fantail welcome Swallow kingfisher	2 3 2 1 1 1	H H H H S S	Slight SW breeze
RS7	tui mynah fantail bellbird yellow Hammer	4 2 2 1 2	H&S H S H S	Slight SW breeze
RS8	tui chaffinch greenfinch Australasian harrier hawk fernbird fantail mynah goldfinch magpie	2 2 2 1 2 1 2 2 1	H H H & S S H H H S H	Breeze SW
RS9	goldfinch starling bellbird chaffinch blackbird	1 11 2 2 1	S S H S H	Calm warm
RS10	tui fantail blackbird mynah magpie bellbird Australasian Harrier hawk fernbird	2 1 1 3 1 1 1 1	H H H H & \$ H H S H	Breezy SW
LS1	white faced Heron pied shag VOC banded dotterel pied stilt welcome swallow chaffinch black backed gull	1 2 2 2 4 3 1 1	S S S S S S H S	Calm. Sea noise and trail bike – very close and disturbing
LS2	royal Spoonbill pied stilt paradise shelduck white faced heron kingfisher sparrow tui mynah fernbird welcome swallow wax eye red billed gull	1 3 42 2 2 2 1 1 2 4 3 1	S S S S S H H H H S H & S S	Calm. Sea noise.
LS3	welcome swallow wax eye fernbird tui goldfinch mynah sparrow kingfisher	4 3 2 2 3 1 3 1	S S S H H H H S	Calm. Sea noise.
LS4	wax eye fernbird green finch sparrow bellbird magpie	5+ 2 1 2 1 2	H H H H H H	Quieter.

	gold finch paradise shelduck kingfisher Australasian harrier hawk	3 2 1 1	H S S S	
LS5	fernbird green finch kingfisher welcome swallow wax eye magpie bellbird	3 1 2 4 2 3 1	H&S H S S H H H	
LS6	Australasian harrier hawk mynah wax eye fernbird gold finch bellbird sparrow welcome swallow kingfisher tui	1 3 3+ 5 1 1 2 2 1 1	S H H H&S H H H H&S S H	
LS7	welcome swallow magpie tui kingfisher mynah NZ pipit	8 3 1 1 2 1	S H&S H S H S	
LS8	fernbird welcome swallow back shag skylark green finch bellbird sparrow waxreye tui	2 1 1 2 2 1 2 2+ 1	H S S H H H H H H	
LS9	wax eye sparrow tui fantail fernbird	5 5 1 1 1	S+H S+H H H H	Wind turned SW.
LS10	fernbird wax eye mynah fantail welcome swallow bellbird	4 11 1 2 1 1	H S H H H H	

15 April, 2015.

Start time 9.00 am Low tide 8.00 am

Site key	Bird species	Number of birds	Seen or heard	Weather conditions and other notes
RS1	pied stilt banded dotterel chaffinch pied shag yellow hammer Caspian tern NZ dotterel wax eye	5 3 5 3 2 2 5 40+	S S S S S S S S	Strong steady SW breeze
RS2	red billed gull mynah banded dotterel green finch NZ pipit paradise shelduck magpie	1 2 2 7 1 2 2	S S S S S S H	
RS3	white faced Heron wax eye	1 6	S S	

	mynah	2	H	
	tui	1	H	
	paradise shelduck	2		
RS4	tui	3	S	breezy
	Australasian harrier hawk	2	H	
	green finch	6	H	
	wax eye	20+	S	
RS5	spur Wing plover	4	S	breezy
	tui	1	H	
	bellbird	1	H	
RS6	pied shag	1	S	breezy
	Australasian harrier hawk	1	S	
	magpie	1	H	
	grey warbler	2	H	
	kingfisher	1	S	
RS7	tui	4	H&S	calm
	mynah	2	H	
	fantail	2	S	
	bellbird	1	H	
	yellow Hammer	2	S	
RS8	wax eye	11+	S	Slight to moderate breeze
	chaffinch	1	S	
	blackbird	1	H	
	bellbird	1		
RS9	chaffinch	1	S	Slight breeze
	blackbird	1	H	
RS10	fernbird	1	H	Slight breeze
	tui	1	H	
	green? finch	3	S	
	wax eye	1	H	
LS1	magpie	2	H	Windy SW
	NZ dotterel	5	S	
	kingfisher	1	S	
	banded dotterel	3	S	
	pied stilt	2	S	
	welcome swallow	2	S	
	Caspian tern	3	S	
	spur wing plover	2	S	
	paradise shelduck	4	S	
LS2	kingfisher	1	S	Windy
	magpie	1	S+H	
	fernbird	2	H	
	Australasian harrier hawk	1	S	
	sparrow	1	S+H	
	blackbird	1	H	
	chaffinch	1	H	
	tui	1	H	
	thrush	1	H	
LS3	Caspian tern	1	S	Windy
	paradise shelduck	3	S	
	spur wing plover	1	H	
	grey warbler	1	H	
	chaf? finch	2	S	
	magpie	2	H+S	
	wax eye	6	S	
	black shag	1	S	
LS4	wax eye	4+	H	windy.
	fernbird	3	H	
	green? finch	1	H	
	bellbird	1	H	
	blackbird	1	H	
	Australasian harrier hawk	1	S	
	grey Warbler	2	H	
LS5	fernbird	2	H	Windy
	pied shag	1	S	
	magpie	1	H	
	wax eye	16	S	
LS6	grey warbler	1	S	Wind chainsaw
	mynah	10	S	
	wax eye	30+	S+H	
	pied shag	1	S	
	Australasian harrier hawk	1	S	
	fernbird	1	H	
	spur wing plover	1	H	
	tui	1	H	

	kingfisher	1	S	
	magpie	2	H	
LS7	pukeko	2	S	Windy
	paradise shelduck	6	S	
	grey warbler	1	H	
	wax eye	20 + 25	S (Two flocks)	
	yellow hammer	1	H	
	bellbird	1	H	
	mynah	1	H	
	tui	1	H	
LS8	gold finch	2	S +H	Windy
	fantail	2	H	
	blackbird	1	H	
	bellbird	1	H	
LS9	wax eye	3	S	Wind y
	yellow hammer	1	H	
	grey Warbler	1	H	
	fantail	2	H	
	fernbird	1	H	
	Australasian harrier hawk	2	S	
LS10	fernbird	4	S+H	Wind!!!!
	green? finch	3	H	
	mynah	2	H	
	tui	1	H	
	Australasian harrier hawk	1	S	
	bellbird	1	H	

29 April, 2016.

Start time 8.00 am Low tide 8.00 am Overcast, mild, slight SW breeze.

Site key	Bird species	Number of birds	Seen or heard	Weather conditions and other notes
RS1	Australasian harrier hawk	1	S	calm
	starling	1	S	
	banded dotterels	1	S	
	pieb shag	1	S	
	spur wing plover	2	S	
	mallard	7	S	
	kingfisher	1	S	
	variable oyster catcher	3	S	
	paradise shelduck	1	S	
RS2	paradise shelduck	3	S	
	magpie	2	h	
	Caspian tern	2	S	
	Australasian harrier hawk	1	S	
	yellow hammer	7	S	
	kingfisher	2	S	
	tui	1	H	
	pieb shag	2	S	
RS3	white faced Heron	1	S	
	pieb stilt	3	S	
	black shag	2	S	
	finches	8	S	
	tui	1	S	
	pieb shag	1	S	
	kingfisher	1	S	
RS4	tui	6	S +H	Road noise
	fernbird	2	H	
	finch	3	S	
	magpie	2	H	
RS5	paradise shelduck	2	S	
	welcome swallow	1	S	
	pieb shag	1	S	
	variable oystercatcher	1	H	
RS6	grey warbler	2	S	Road noise
	bellbird	2	H	
	tui	3	H	
RS7	tui	1	H	Calm, road noise.
	blackbird	1	H	
	magpie	1	H	
	fantail	1	S+H	
	grey warbler	1	S	

RS8	tui magpie finches Australasian harrier hawk	3 1 3 1	H H S S	Breeze
RS9	fantail Chaffinch Banded rail	1 1 1	H H H	Breeze
RS10	Fernbird tui Australasian harrier hawk	1 4 1	H H S	Breeze
LS1	magpie NZ dotterel black backed gull pied stilt Caspian tern spur wing plover paradise shelduck pateke mallard black shag red billed gull mynah pied shag variable oyster catcher	2 3 1 4 1 3 2 3 7 1 1 2 4 7	S+H S S S+H S S S S S S S H S S+H	Calm
LS2	kingfisher white fronted heron Australasian Harrier Hawk sparrow tui Caspian tern kingfisher paradise shelduck black shag wax eye Pped stilt	2 1 1 3 1 1 2 1 1 3 1	S H S H H S S S S S+H S	
LS3	pheasant paradise shelduck fernbird pied shag wax eye kingfisher Australasian harrier hawk	1 2 3 1 5 1 1	H S+H H S S+H H S	Cooler, SW breeze.
LS4	wax eye fernbird chaf?finch bellbird magpie tui gey warbler paradise shelduck	5+ 5 3+ 3 1 2 1 1	H H H H H H H H	
LS5	fernbird bellbird finches wax eye blackbird kingfisher tui grey warbler	5 1 3+ 1 1 1 4 1	H H H H H H H H	Breezy
LS6	gey warbler blackbird pied shag yellow hammer fernbird kingfisher finches bellbird	7 1 1 5 4 1 5 1	S+H H S+H S+H H S H H	Still
LS7	blackbird fernbird grey warbler wax eye yellow hammer pheasant tui	2 2 4 4 3 1 1	H H S+H H S+H H H	
LS8	wax eye magpie	10+ 1	S +H H	

	tui	1	H	
	bellbird	1	H	
	mynah	3	H	
	grey warbler	3	H	
	fernbird	1	H	
LS9	wax eye	5+	H	
	grey warbler	2	H	
	tui	2	H	
	fernbird	1	H	
	paradise shelduck	1	H	
	bellbird	1	H	
	blackbird	H	H	
LS10	fernbird	3	H	
	yellow hammer	2	H	
	mynah	1	H	
	tui	1	H	
	bellbird	2	S	
	grey warbler	3	H	
	wax eye	2	H	
	spur winged plover	1	H	

Appendix Four

Bird Survey List

(Seen or heard in the Waikawau Bay area in the last twelve years)

<i>Acridotheres tristis</i>	Indian mynah
<i>Alauda arvensis arvensis</i>	skylark
<i>Anas aucklandica chlorotis</i>	brown teal (pateke)
<i>Anas platyrhynchos platyrhynchos</i>	mallard duck
<i>Anas superciliosa superciliosa</i>	grey duck
<i>Anthornis melanura</i>	bellbird
<i>Anthus novaeseelandiae</i>	New Zealand pipit
<i>Ardea novaehollandiae novahollandiae</i>	white-faced heron
<i>Botaurus poiciloptilus</i>	Australian brown bittern
<i>Bowdleria punctata</i>	fernbird
<i>Branta canadensis moffitti</i>	giant Canada goose
<i>Carduelis chloris chloris</i>	greenfinch
<i>Charadrius obscurus</i>	New Zealand dotterel
<i>Charadrius bicinctus bicinctus</i>	banded dotterel
<i>Chrysococcyx lucidus lucidus</i>	shining cuckoo
<i>Circus approximans</i>	Australasian harrier hawk
<i>Cygnus atratus</i>	black swan
<i>Egretta alba</i>	white heron
<i>Egretta sacra sacra</i>	reef heron
<i>Emberiza citronella</i>	yellowhammer
<i>Eudyptula minor</i>	Little blue penguin
<i>Fringilla coelebs gengleri</i>	chaffinch
<i>Gerygone igata</i>	grey warbler
<i>Gymnorhina tibicen</i>	white backed magpie
<i>Gymnorhina tibicen tibicen</i>	black backed magpie
<i>Haematopus unicolor</i>	variable oystercatcher

<i>Haematopus ostralegus finschi</i>	South island pied oyster catcher
<i>Halcyon sancta vagans</i>	New Zealand kingfisher
<i>Himantopus himantopus leucocephalus</i>	pied stilt
<i>Hirundotahitica neoxena</i>	welcome swallow
<i>Hydroprogne caspia</i>	Caspian tern
<i>Larus dominicus dominicus</i>	black backed gull
<i>Larus scoplinus</i>	red billed gull
<i>Limosa lapponica baueri</i>	eastern bar-tailed godwit
<i>Lophortyx californica brunnescens</i>	Californian quail
<i>Nestor meridionalis septentrionalis</i>	north island kaka
<i>Ninox novaeseelandiae novaeseelandiae</i>	morepork
<i>Passer domesticus</i>	house sparrow
<i>Phalacrocorax carbo</i>	little black shag
<i>Phalacrocorax sulcirostris</i>	black shag
<i>Phalacrocorax varius</i>	pied shag
<i>Phasianus colchicus torquatus</i>	ring-necked pheasant
<i>Platalea leucorodia regia</i>	royal spoonbill
<i>Platycercus eximius</i>	eastern rosella
<i>Porphyrio porphyrio melanotus</i>	pukeko
<i>Prosthemadera novaeseelandiae</i>	tui
<i>Prunella modularis</i>	hedge sparrow
<i>Rallus philippenis philippenis</i>	banded rail
<i>Rhipidura fuliginosa placabilis</i>	North Island fantail
<i>Sterna albifrons sinensis</i>	eastern little tern
<i>Sturnas vulgaris vulgaris</i>	starling
<i>Sula bassana serrator</i>	Australasian gannet
<i>Tadorna variegata</i>	paradise shelduck
<i>Tringa brevipes</i>	Siberian tattler
<i>Turdus merula merula</i>	blackbird

Turdus philomelos clarkei

thrush

Vanellus miles novaehollandiae

spurwinged plover

Zosterops lateralis lateralis

wax eye

