

Introduction

This report is a summary of the trial observations carried out to assess the effect of clam harvesting on the birds using the bank off Port Chalmers in Otago Harbour, known as area 1805.

It was hoped to cover area 1804 on the seaward side of Quarantine Island in a similar manner but the distance from the shore and the lack of suitably high observation point has made this difficult. However I would suggest that detailed observations of area 1805 as documented below will allow adequate monitoring of the most important species, pied oystercatcher, and that area 1804 should be visited by boat every month to assess bird numbers and species present.

The Ornithological Society of New Zealand (OSNZ) is starting a year of monthly counts of the birds of the whole harbour in September 2009 and this, with their continuing biannual wader count will provide further baseline data.

Derek Onley September 2009

Methods

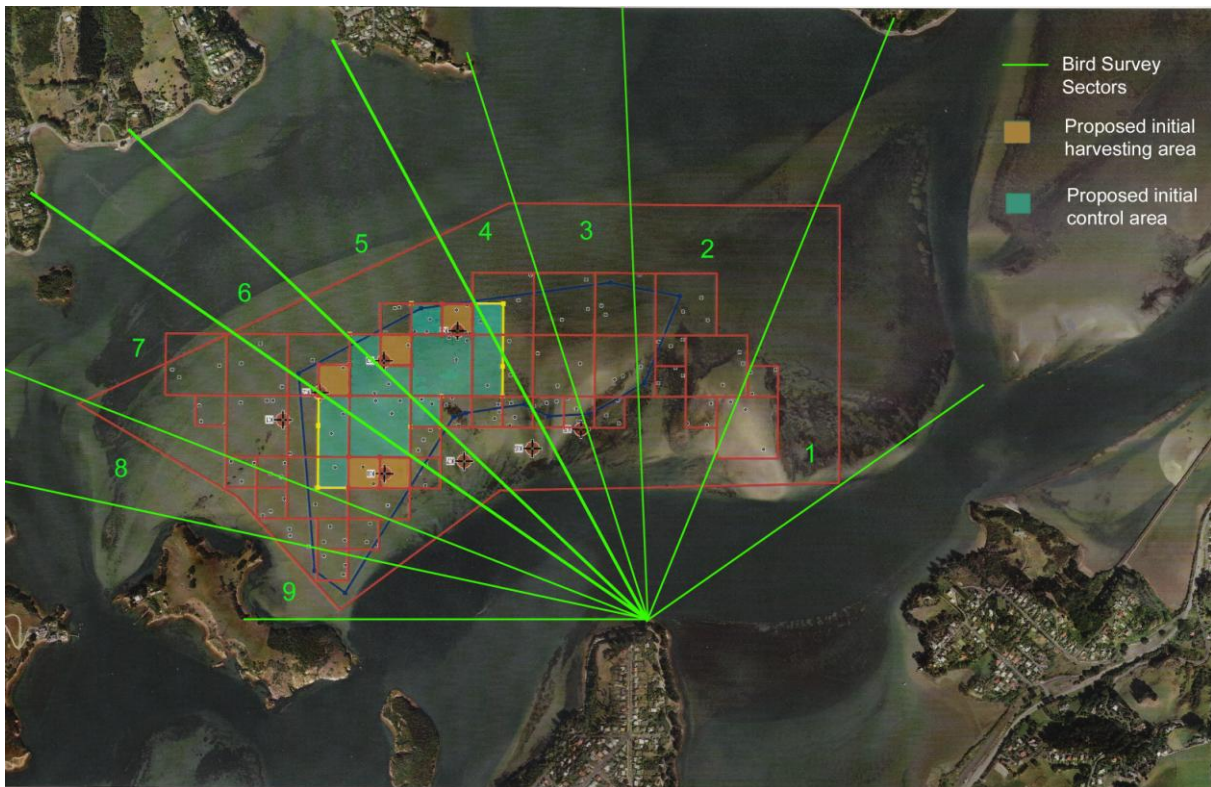


Figure 1. Area 1805. Green lines radiate from observation point and delineate observation sections 1-9.

Bird surveys were carried out from the end of Victory Place where it overlooks area 1805 (Figure 1). I used a telescope to observe the birds on the exposed sandbanks over several hours either side of low tide. See Figure 2 for dates and times.

I divided the area into 9 sections using convenient markers on the far side of the harbour. For each section I only counted only those birds using the exposed sandbanks and the immediate margins.

For each species I recorded whether the birds were using the area for feeding or roosting and in addition, for oystercatchers, whether birds were feeding along the waters edge, in the water, or on the drier bank. On the final count I also recorded numbers of oystercatchers using the far (southern) or near (northern) edge of the exposed bank.

Species present and numbers

Date	2.12.08	2.12.08	10.12.08	6.1.09	13.1.09	26.1.09	4.2.09	15.2.09	2.3.09
Time	1200-1300	1315-1400	1830-2000	1700-1830	1110-1300	1000-1220	1600-1800	1400-1600	1330-1530
Pied Oystercatcher	107	113	102	193	196	328	262	255	343
Variable Oystercatcher	8	2	0	2	0	3	2	0	5
Bar-tailed Godwit	0	0	0	0	0	0	0	0	1
Red-billed Gull	362	31	73	73	167	336	710	183	217
Black-backed Gull	147	32	38	17	59	555	228	182	133
Black-billed Gull	0	0	0	0	0	59	83	94	21
White-fronted Tern	0	0	0	0	0	3	0	0	0
Black-fronted Tern	0	0	0	0	0	0	2	8	9
Caspian Tern	0	0	0	0	0	2	0	4	6
Little Shag	2	7	8	10	10	17	9	18	10
Mallard ...	3	8	15	29	23	43	46	24	7
Royal Spoonbill	5	3	5	2	9	8	5	7	0
White-faced Heron	3	7	5	5	4	13	6	7	1

Figure 2 Area 1805. Dates, times and total birds observed.

The thirteen species recorded were known to use the area and the only unexpected result was the lack of bar-tailed godwits. Only one was recorded on 2 March, whereas on the other proposed harvesting area, 1804, over 100 are seen regularly in the summer months. By far the most numerous species were Black-backed and Red-billed Gulls and Pied Oystercatchers. Black-billed Gulls reached almost 100 in February but the other species were only recorded in low numbers.

Use of the Sandbanks over Low tide

Birds use the exposed sandbanks and adjacent shallow water over low tide for both feeding and roosting (Fig 4). As a rule waders, herons and ducks use the banks almost entirely for feeding whereas gulls and terns use the area as a roost site as well.

Species	% Feeding	%Roosting	Total observations
Red-billed Gull	57	43	2121
Pied Oystercatcher	93	7	1831
Black-backed Gull	25	75	1212
Black-billed Gull	60	40	257
Mallard	98	2	198
Little Shag	44	56	91
White-faced Heron	100	0	51
Royal Spoonbill	100	0	44
Variable Oystercatcher	82	18	22
Black-fronted Tern	63	37	19
Caspian Tern	0	100	12
White-fronted Tern	0	100	3
Bar-tailed Godwit	100	0	1

Figure 4. Use of the area 1805 at low tide. Percentage feeding and roosting.

Temporal Distribution

Over the three months of observations, Pied Oystercatcher numbers increased about threefold. (Fig 5). This is a common pattern on Otago estuaries as the birds return to the coast from their breeding grounds inland on braided rivers and farmland.

Black-billed Gulls show a similar pattern (Fig 6), arriving in the area in February from breeding grounds in Southland.

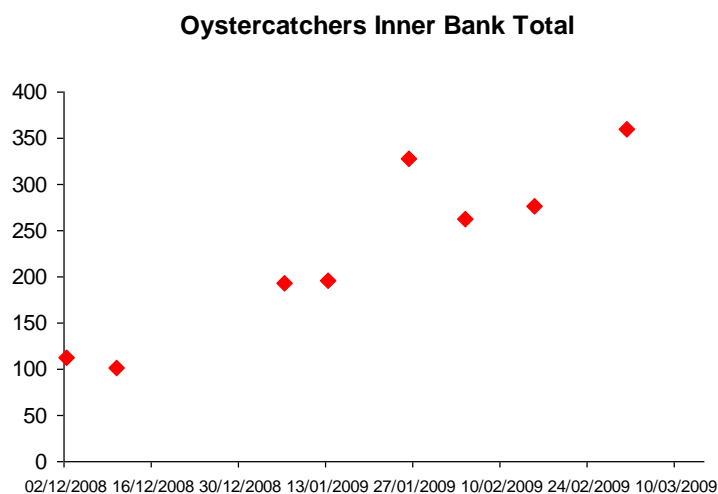


Figure 5 Area 1805. Pied Oystercatcher; totals for each visit.

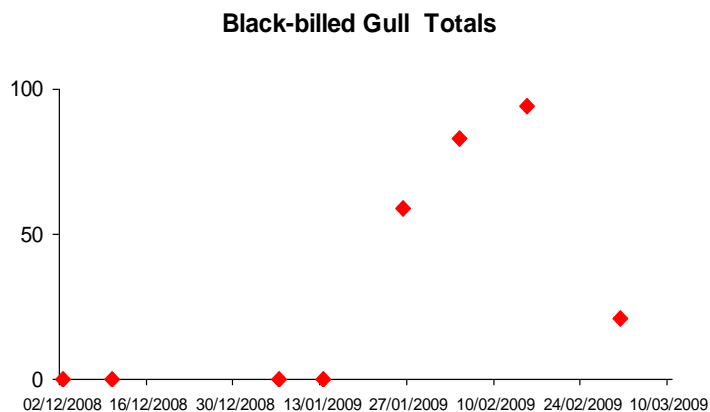


Figure 6 Area 1805. Black-billed Gull; totals for each visit.

Black-backed and Red-billed Gull numbers (Figs 7 & 8) vary considerably and there are no discernable trends. Higher numbers were associated with gull flocks feeding on what appeared to be “krill” (probably the euphausiid, *Nyctiphanes australis*) stranded by the falling tide on the emerging sandbanks.

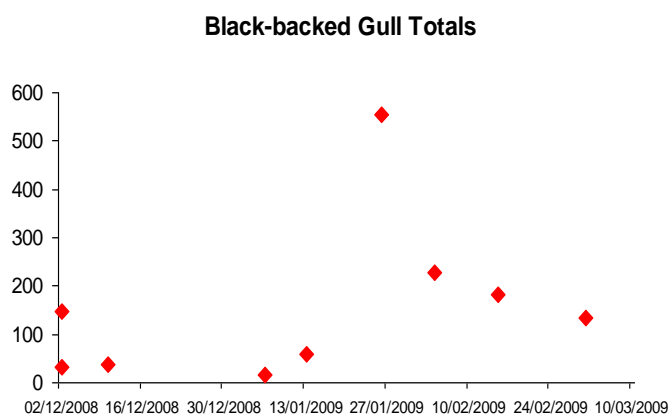


Figure 7 Area 1805. Black-backed Gull; totals for each visit.

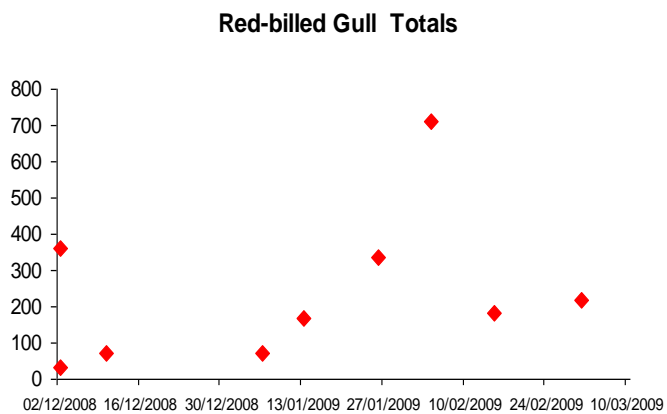


Figure 8 Area 1805. Red-billed Gull; totals for each visit.

Gull numbers tended to be higher before low tide; a result of the higher numbers feeding on stranded "krill" as the tide fell. In contrast Pied Oystercatcher numbers tended to peak over low tide when the maximum amount of sandbank was exposed.

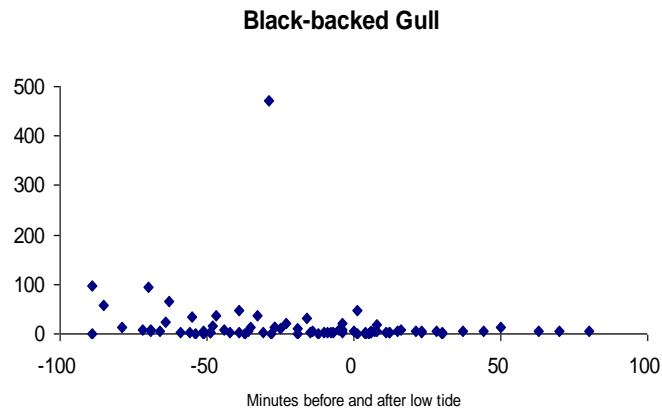


Figure 9 Area 1805. Black-backed Gull, numbers 1 hour 20 minutes before and after low tide.



Figure 10 Area 1805. Red-billed Gull, numbers 1 hour 20 minutes before and after low tide.

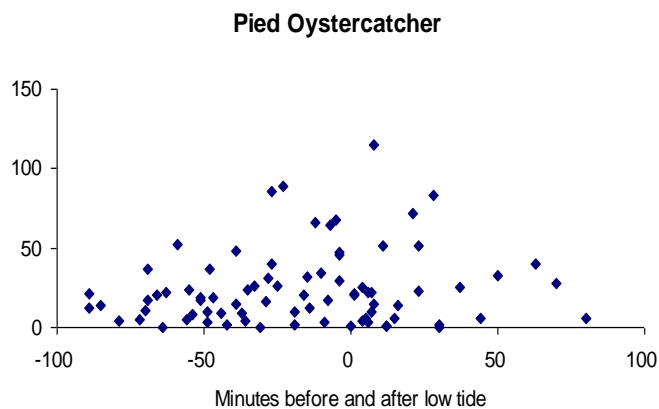


Figure 11 Area 1805. Pied Oystercatcher, numbers 1 hour 20 minutes before and after low tide.

Spatial Distribution

Pied Oystercatcher

Date	Section Number									total	no in 5,6&7	% in 5,6&7
	9	8	7	6	5	4	3	2	1			
2.12.08	11	1	3	17	47	21	4	6	3	113	67	59
10.12.08	12	37	5	20	5	10	9	4	0	102	30	29
6.1.09	9	31	10	32	34	29	25	22	1	193	76	39
13.1.09	19	48	40	2	46	10	6	23	2	196	88	45
26.1.09	16	20	51	51	83	33	40	28	6	328	185	56
4.2.09	14	11	24	37	86	66	1	22	1	262	147	56
15.2.09	22	19	24	26	89	68	15	14	0	277	139	50
2.3.09	17	15	26	20	64	115	72	25	6	360	110	31
Total	120	182	183	205	454	352	172	144	19	1831	842	46

Figure 12 Pied Oystercatcher. Distribution across sections defined in map (Fig 1) Section 5, 6 & 7 include the areas proposed for harvesting.

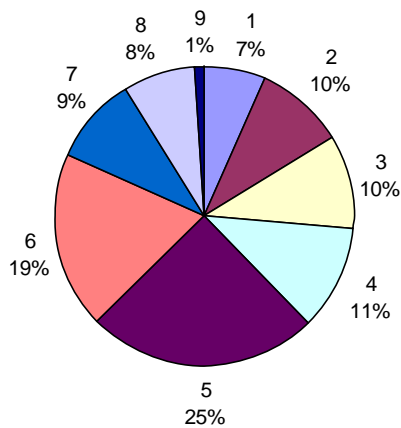


Figure 12a Pied Oystercatcher Percentage distribution across sections. Totals Dec 08 – Mar 09

The sections containing the proposed harvesting areas, 5, 6 & 7, have over half the total number of observations of oystercatchers. Numbers counted each visit in those areas varied over the observation period from 31% – 59% of the total for the day.

Pied Oystercatcher Feeding sites

In order to further assess the distribution of pied oystercatchers, birds were recorded as feeding a) near the waters edge, either in the water upto tarsus depth or within a few metres of the water on the dry bank (edge), b) in the water upto belly depth or c) spread across the dry bank. The preferred feedings site appeared to be along the waters edge or in the water, 52 – 82% of observations coming from these sites. (Figure 12b). However on the lowest tide (0.1m.) very few birds were feeding in the water, possibly due to the steeper drop off into the deeper water of the channels immediately alongside the banks. The percentages feeding in each site appeared to be similar in each section. (Figure 12c)

Date	Number	% edge	% in water	% on bank	LT ht m
10.12.08	77	40	42	18	0.2
6.1.09	187	35	25	40	0.4
13.1.09	198	46	6	48	0.1
26.1.09	307	41	13	46	0.4
4.2.09	259	46	29	25	0.4
15.2.09	259	41	25	34	0.4
2.3.09	347	35	25	40	0.4

Figure 12b Feeding locations of Pied Oystercatchers, by low tide, all section combined.

Section	9	8	7	6	5	4	3	2	1	All sections
Number observations	12	136	179	310	382	174	172	166	103	1634
% Waters Edge	42	51	39	42	39	30	35	42	53	40
% In water	17	18	16	26	16	26	28	32	17	22
% On exposed bank	42	32	46	32	45	44	37	26	30	38

Figure 12c Feeding locations of Pied Oystercatchers by section, all dates combined.

On the final count I also recorded numbers of oystercatchers using the far (southern) or near (northern) edge of the exposed bank. This confirmed the impression that the majority (76%) of birds favoured the far bank, a pattern common to all sections except section 4. (Figure 12d) This is probably a reflection of the steeper drop off into a deep water channel on the near, northern edge compared with the more extensive shallows on the far, southern edge.

Location	9	8	7	6	5	4	3	2	1	Total	%
Far side	1	9	32	45	20	1	23	6	9	146	76
Near side	0	3	19	15	3	1	1	2	3	47	24

Figure 12d Feeding locations of Pied Oystercatchers at the waters edge.

Red-billed Gull

Date	Section Number									total	no in 5,6&7	% in 5,6&7
	9	8	7	6	5	4	3	2	1			
2.12.08	0	0	14	25	26	4	3	250	40	362	65	18
10.12.08	2	7	9	13	25	8	4	5	0	102	47	46
6.1.09	0	6	4	27	12	5	2	13	4	193	43	22
13.1.09	2	12	7	13	26	27	26	9	45	196	46	23
26.1.09	0	4	26	23	28	21	16	40	178	328	77	23
4.2.09	1	7	14	46	55	88	304	184	11	262	115	44
15.2.09	20	24	31	27	19	7	11	21	23	277	77	28
2.3.09	17	2	2	11	64	7	62	52	0	360	77	21
Total	42	62	93	160	229	163	425	324	261	2080	482	23

Figure 13 Red-billed Gull. Distribution across sections defined in map (Fig 1)
Section 5, 6 & 7 include the areas proposed for harvesting.

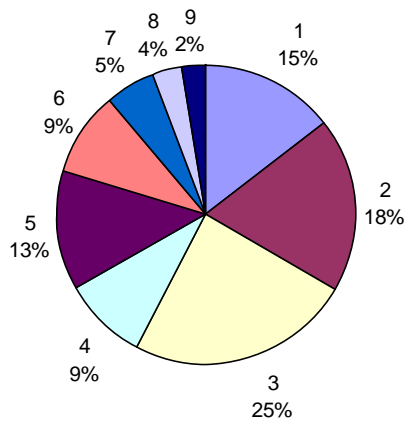


Figure 13a Red-billed Gull
Percentage distribution across sections. Totals Dec 08 – Mar 09

58% of observations of Red-billed Gulls came from sections 1-3 with 27% of the observations coming from the proposed harvesting areas, 5-7. However the range in counts (0-304) was high.

Black-backed Gull

Date	Section Number									total	no in 5,6&7	% in 5,6&7
	9	8	7	6	5	4	3	2	1			
2.12.08	2	2	0	2	23	7	2	12	97	147	25	17
10.12.08	2	5	8	3	3	4	9	4	0	102	14	14
6.1.09	2	4	2	2	2	3	1	1	0	193	6	3
13.1.09	1	6	5	6	9	10	13	3	6	196	20	10
26.1.09	5	4	4	14	4	2	3	48	471	328	22	7
4.2.09	3	4	4	1	14	17	33	94	58	262	19	7
15.2.09	3	8	19	7	20	11	13	36	65	277	46	17
2.3.09	5	4	4	4	2	31	36	47	0	360	10	3
Total	23	37	46	39	77	85	110	245	697	1865	162	9

Figure 14 Black-backed Gull. Distribution across sections defined in map (Fig 1)
Section 5, 6 & 7 include the areas proposed for harvesting.

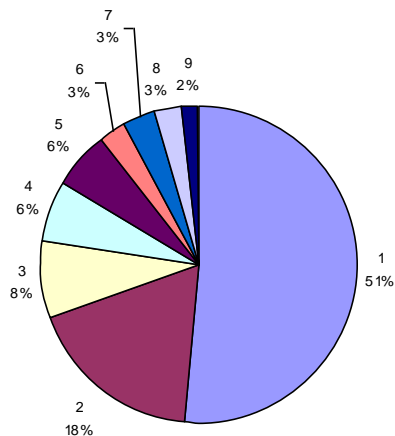


Figure 14a Black-backed Gull
Percentage distribution across
sections. Totals Dec 08 – Mar 09

Over 50% of observations of Black-backed Gulls came from section 1 with just 12% of the observations coming from the proposed harvesting areas, 5-7. However like Red-billed Gulls the range in counts (0-471) was high.

Black-billed Gull

Date	Section Number									total	no in 5,6&7	% in 5,6&7
	9	8	7	6	5	4	3	2	1			
2.12.08	0	0	0	0	0	0	0	0	0	0	0	0
10.12.08	0	0	0	0	0	0	0	0	0	0	0	0
6.1.09	0	0	0	0	0	0	0	0	0	0	0	0
13.1.09	0	0	0	0	0	0	0	0	0	0	0	0
26.1.09	0	17	2	3	35	0	2	0	0	59	40	68
4.2.09	0	0	0	0	25	53	1	4	0	83	25	30
15.2.09	0	91	2	0	1	0	0	0	0	94	3	3
2.3.09	0	0	0	1	12	8	0	0	0	21	13	62
Total	0	108	4	4	73	61	3	4	0	257	81	32

Figure 15 Black-billed Gull. Distribution across sections defined in map (Fig 1)
Section 5, 6 & 7 include the areas proposed for harvesting.

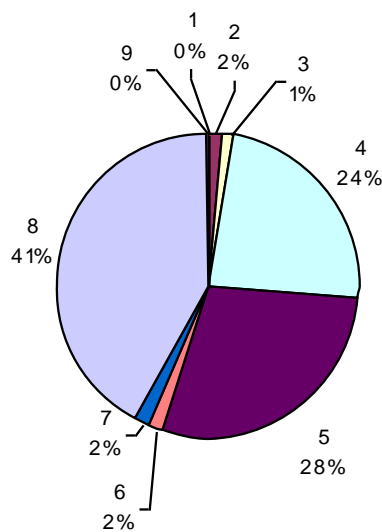


Figure 15a Black-billed Gull
Percentage distribution across sections. Totals
Dec 08 – Mar 09

Black-billed Gulls appeared to favour areas 4, 5 & 8 with over 90% of observations coming from those areas. 32% of the observations came from the proposed harvesting areas, 5-7. However the range in counts (0-91) was high and numbers relatively low.

Little Shag

Date	Section Number									total	no in 5,6&7	% in 5,6&7
	9	8	7	6	5	4	3	2	1			
2.12.08	0	0	0	0	0	1	0	6	0	7	0	0
10.12.08	0	0	2	2	0	2	0	2	0	8	4	50
6.1.09	0	1	0	2	2	1	2	1	1	10	4	40
13.1.09	0	4	0	0	1	2	2	0	1	10	1	10
26.1.09	0	0	0	0	0	0	11	2	4	17	0	0
4.2.09	0	0	0	0	1	1	3	1	3	9	1	11
15.2.09	0	3	0	0	1	2	4	7	1	18	1	6
2.3.09	1	0	0	0	0	2	4	3	0	10	0	0
Total	1	8	2	4	5	11	26	22	10	89	11	12

Figure 16 Little Shag. Distribution across sections defined in map (Fig 1)
Section 5, 6 & 7 include the areas proposed for harvesting.

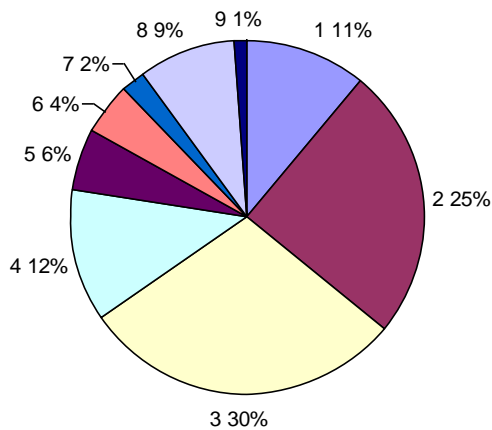


Figure 16a Little Shag
Percentage distribution across
sections. Totals Dec 08 – Mar 09

Little Shags appear to favour sections 1-4, with nearly 80% of observations coming from those areas. The proposed harvesting areas, 5-7 accounted for only 12% of total observations. However numbers were low and range, 0-11, relatively high.

Royal Spoonbill

Date	Section Number									total	no in 5,6&7	% in 5,6&7
	9	8	7	6	5	4	3	2	1			
2.12.08	3	3	0	0	0	0	0	0	2	8	0	0
10.12.08	0	1	0	1	0	0	3	0	0	5	1	20
6.1.09	0	0	0	0	1	0	0	1	0	2	1	50
13.1.09	0	3	0	0	1	5	0	0	0	9	1	11
26.1.09	0	0	7	1	0	0	0	0	0	8	8	100
4.2.09	3	0	0	0	2	0	0	0	0	5	2	40
15.2.09	0	0	0	0	0	0	0	7	0	7	0	0
2.3.09	0	0	0	0	0	0	0	0	0	0	0	0
Total	6	7	7	2	4	5	3	8	2	44	13	30

Figure 17 Royal Spoonbill Distribution across sections defined in map (Fig 1)
Section 5, 6 & 7 include the areas proposed for harvesting.

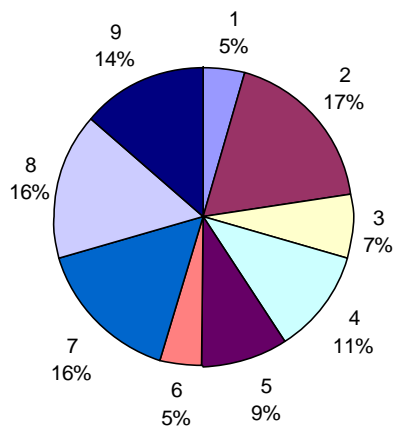


Figure 17a Royal Spoonbill
Percentage distribution across
sections. Totals Dec 08 – Mar 09

White-faced Heron

Date	Section Number									total	no in 5,6&7	% in 5,6&7
	9	8	7	6	5	4	3	2	1			
2.12.08	3	2	2	3	0	0	0	0	0	10	5	50
10.12.08	0	1	3	1	0	0	0	0	0	5	4	80
6.1.09	0	0	0	1	1	0	2	0	1	5	2	40
13.1.09	0	0	0	2	0	0	0	0	2	4	2	50
26.1.09	0	0	3	0	4	2	2	1	1	13	7	54
4.2.09	0	2	3	0	0	1	0	0	0	6	3	50
15.2.09	0	0	0	2	0	2	1	0	2	7	2	29
2.3.09	0	0	0	0	0	0	1	0	0	1	0	0
Total	3	5	11	9	5	5	6	1	6	51	25	49

Figure 18 White-faced Heron Distribution across sections defined in map (Fig 1)
Section 5, 6 & 7 include the areas proposed for harvesting.

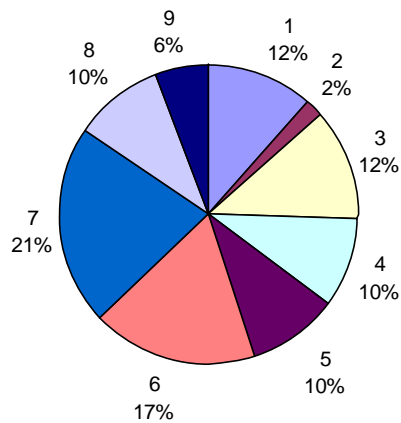


Figure 18a White-faced Heron
Percentage distribution across
sections. Totals Dec 08 – Mar 09

Mallard

Date	Section Number									total	no in 5,6&7	% in 5,6&7
	9	8	7	6	5	4	3	2	1			
2.12.08	0	0	0	0	0	3	5	3	0	11	0	0
10.12.08	0	0	4	0	2	0	9	0	0	15	6	0
6.1.09	0	20	7	0	0	0	2	0	0	29	7	0
13.1.09	0	12	10	0	0	0	0	0	1	23	10	0
26.1.09	0	0	15	0	4	0	0	0	24	43	19	0
4.2.09	0	0	0	22	22	0	0	0	2	46	44	0
15.2.09	0	0	24	0	0	0	0	0	0	24	24	0
2.3.09	0	0	0	6	0	0	0	1	0	7	6	0
Total	0	32	60	28	28	3	16	4	27	198	116	0

Figure 19 Mallard Distribution across sections defined in map (Fig 1)
Section 5, 6 & 7 include the areas proposed for harvesting.

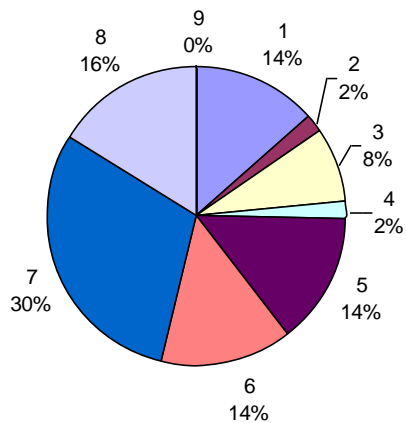


Figure 19a Mallard
Percentage distribution across
sections. Totals Dec 08 – Mar 09

Conservation status

Common Name	Scientific Name	Status	Threat Ranking
Pied Oystercatcher	<i>Haematopus finschi</i>	Endemic	At Risk, Declining
Variable Oystercatcher	<i>Haematopus unicolor</i>	Endemic	At Risk, Recovering
Bar-tailed Godwit	<i>Limosa lapponica baueri</i>	Native, Migrant	Secure overseas
Red-billed Gull	<i>Larus novaehollandiae</i>	Native	Nationally Vulnerable
Black-backed Gull	<i>Larus dominicanus</i>	Native	Not Threatened
Black-billed Gull	<i>Larus bulleri</i>	Endemic	Nationally Endangered
White-fronted Tern	<i>Sterna striata striata</i>	Endemic	At Risk, Declining
Black-fronted Tern	<i>Chlidonias albostratus</i>	Endemic	Nationally Endangered
Caspian Tern	<i>Hydroprogne caspia</i>	Native	Nationally Vulnerable
Little Shag	<i>Phalacrocorax melanoleucos brevirostris</i>	Native	At Risk, Naturally Uncommon, Increasing
Mallard	<i>Anas platyrhynchos</i>	Introduced	
Royal Spoonbill	<i>Platalea regia</i>	Native	At Risk, Naturally Uncommon
White-faced Heron	<i>Ardea novaehollandiae</i>	Native	Not Threatened

Figure 3 Latest Conservation status (Threat rankings) of species observed in area 1805, from Miskelly et al. Notornis 2008, 117-135.

Miskelly et al 2008 have recently reassessed the conservation status of New Zealand birds (Fig 3). Of the 13 species using the bank only 2, Black-backed Gull and White-faced Heron are now considered secure i.e. "Not Threatened". Of the 3 other species that occur in high numbers on the bank, two, Pied Oystercatcher and Red-billed Gull are considered to be "At Risk" and the other, the endemic Black-billed Gull is "Nationally Endangered". The risk categorisation for Red-billed Gull appears surprising when you consider the large numbers within the harbour and the city but it is based on recent substantial declines in numbers in the larger coastal breeding colonies throughout the country.

It is likely that in any future resource consent application more consideration will be given to the effects of harvesting upon the reclassified species, notably pied oystercatchers, than has occurred in the past.