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REFINING NZ

CRUDE SHIPPING PROJECT

COASTAL BIRD SURVEY

FEBRUARY – MARCH 2015

BIORESEARCHES

Consulting Biologists - Established 1972
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Refining NZ

Crude Shipping Project

Coastal Bird Survey

February – March 2015

JUNE 2015

FOR: **CHANCERYGREEN ON BEHALF OF REFINING NZ**

BY: **BIORESEARCHES GROUP LIMITED**

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CONTENTS

Page No.

1 INTRODUCTION

This report presents the results of baseline surveys completed in February – March 2015 that aimed at characterising the use of five habitats adjacent to the Project area –

Bream Bay Beach (at Mair Road)

Mair Bank

Taurikura Bay

McKenzie Bay

Urquharts Bay.

The habitats were selected as being most likely to be potentially at risk from the Project's activities and were also representative of the intertidal habitats in the vicinity that are utilised by coastal birds, especially wading birds.

The habitats from Marsden Bay to One Tree Point, Snake and McDonalds Banks, and the northern coastline around to McLeod Bay were considered sufficiently remote from the Project area to preclude a significant effect on the coastal bird population. An external review of the investigation proposal was undertaken by NIWA on behalf of Northland Regional Council; no additional survey areas were proposed by that review.

The surveys were completed in February – March which is the "standard" or "preferred" period for once-off coastal bird surveys, especially wading birds, because both the diversity and abundance are generally highest at that time; both overseas and internal New Zealand migrant species are present and breeding activities have been completed.

The Bream Bay Beach survey aimed at typifying bird use of open sandy habitat to the southwest of Marsden Point but excluding the atypical but high value Ruakaka River mouth and estuary. Mair Bank is the key intertidal bank habitat in the outer Whangarei Heads area with Calliope Bank being water-covered most of the time. The northern coastline was surveyed from the western end of Taurikura Bay to the southern end of Urquharts Bay near Home Point and included a range of habitat types – sand, cobbles, boulders and rocky outcrops – that typify the northern coastline.

There are also coastal birds that utilise the Refining New Zealand (RNZ) site itself e.g. white-fronted tern, N.Z. dotterel, red-billed gull, pied stilt and variable oystercatcher. This assessment does not include investigations within the RNZ site that contains significant breeding colonies of N.Z. dotterel and red-billed gull because the Project is remote from the breeding sites. However during the breeding season a survey of nearby intertidal habitats will be undertaken to assess adult feeding behaviour and hence any potential effects on the rearing of juveniles within the RNZ site.

A summary of the existing information, that includes reference to comprehensive and long-term surveys of Marsden Bay to the west of Northport, is presented in the Phase I report.

2 METHODS

The current methodology was externally reviewed by NIWA on behalf of Northland Regional Council. Further, the overall methodology was the same as used for the Marsden Cove Ltd (Marsden Bay) monitoring that was approved by Northland Regional Council and the Department of Conservation (Bioresearches 2003 to 2015).

Counts were undertaken each hour to cover a range of tidal conditions, using Leupold BX-2 Cascades 10x42 binoculars and a Kowa TSN -883 Prominar Spotting Scope with a 25-60x wide zoom eyepiece. Before each count the air temperature was measured using a quartz digi-thermo (-10 to +110^{o}C) thermometer; wind speed and barometric pressure were measured with a Silva Alba Windwatch and general weather conditions recorded. All data were entered on pre-prepared, waterproof record sheets.

All coastal bird species were identified, counted and their use of the habitat recorded according to the following :

FI	**:**	feeding in the intertidal area
FW	**:**	feeding in or over the water
REI	**:**	resting in the intertidal area
REW	**:**	resting on the water
ROI	**:**	roosting (waders only) in the intertidal area
ROP	**:**	resting/roosting on stakes, poles, rock walls

3 RESULTS

3.1 Bream Bay Beach

The survey area is shown in Figure 1 with the observation point being the elevated end of Mair Road. The length of Bream Bay Beach surveyed was c.1350 m to the northeast (as defined by coastal pine trees) and c.1000 m to the southwest (as defined by a power pylon), a total length of c.2350 m of Bream Bay Beach habitat.

The raw data are shown in Appendix 5.1.

3.1.1 Tide and weather conditions

The tide times and general weather conditions during the survey are summarised below.

23 March 2015 : wind NW to 3 kts decreasing to <1 kt at 1200 and then NE to 5kts; average c.3 kts; light showers clearing to sunny conditions with cloud that cleared late afternoon.

HW 1042 2.9 m

LW 1652 0.2 m

TABLE 1 AIR TEMPERATURE (^{o}C) AND BAROMETRIC PRESSURE (hPa)

	n	mean	SD	SE	measured range
air temperature	9	21.3	2.3	0.8	18.1 – 23.7
barometric pressure	9	1016.7	1.2	0.4	1015 - 1018

The survey was completed between 0900 and 1700 hours inclusive, daylight saving time, and specifically targeted the 23rd March as it provided the equal lowest low tide level (0.2 m) that occurred in the February – March 2015 period. As the intertidal habitat is relatively narrow along Bream Bay Beach, the lowest low tide level was considered the situation most likely to reflect maximum bird use of that habitat.

Figure 1. Bream Bay Beach: Coastal bird survey area.

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3.1.2 Species diversity and maximum numbers

The species recorded during the survey and their maximum numbers are as follows together with their conservation ratings.

TABLE 2 SPECIES RECORDED DURING THE BREAM BAY BEACH SURVEY 23 MARCH 2015

COMMON NAMES	SCIENTIFIC NAME
australasian gannet; takapu	*Morus serrator*
black-backed gull; karoro	*Larus dominicanus dominicanus*
caspian tern; taranui •	*Hydroprogne caspia*
red-billed gull; tarapunga •	*Larus novaehollandiae scopulinus*
variable oystercatcher; toreapango •	*Haematopus unicolor*
white-fronted tern; tara •	*Sterna striata*

(• species of national conservation concern, Robertson *et al* 2013)

- **THREATENED SPECIES**

caspian tern	:	nationally vulnerable;	SO, Sp
red-billed gull	:	nationally vulnerable	

- **AT RISK SPECIES**

white-fronted tern	:	declining;	DP
variable oystercatcher	:	recovering;	Inc

[SO = secure overseas; Sp = sparse; DP = data poor; Inc = increasing]

The total diversity was low at six species, however, two species are "threatened" and two "at risk" on a national basis.

Potential reasons for the "threatened" and "at risk" ratings are as follows (Heather & Robertson, 2015; Hitchmough *et al* 2007; Miskelly *et al 2008;* Robertson *et al* 2013; www.nzbirdsonline.org.nz).

caspian tern : disruption and predation at, and loss of bare sandspit breeding habitat.

red-billed gull : documented population decline at the three largest colonies – Three Kings, Mokohinaus and Kaikoura;

reported possible link to changes in oceanic productivity and climate change.

white-fronted tern : unknown precisely but severe predation of breeding adults, eggs and chicks occurs; general disturbance – people and dogs; nest flooding.

variable oystercatcher : previous nesting habitat disturbance has probably decreased as a result of management of species such as NZ dotterel and fairy tern.

The maximum numbers recorded are shown in Table 3 below and reflect the use of the habitat during a 0.2 m low tide.

TABLE 3 MAXIMUM NUMBERS RECORDED ON BREAM BAY BEACH (NORTH & SOUTH SECTORS COMBINED)

	maximum number
australasian gannet	4
black-backed gull	7
caspian tern	2
red-billed gull	18
variable oystercatcher	5
white-fronted tern	1

Numbers of birds were low but not unexpected given the habitat type.

Overall, both species diversity and the maximum numbers recorded were low and that is consistent with a parallel survey of c.2 km of Bream Bay Beach on the northern side of the Waipu River mouth (Bioresearches, 2007). The species recorded using that area were australasian gannet, black-backed gull, caspian tern, little shag, NZ dotterel (1 record of 1 individual), in autumn, pied shag, red-billed gull and variable oystercatcher based on seven surveys in both summer and autumn consisting of a total of 42 hours of field observation.

The maxima recorded in the area of Bream Bay Beach 1 to 2 km (1000 m length of coastline) north of Waipu River mouth in similar habitat to the Mair Road Bream Bay Beach area were as follows (February – March 2007; 24 hours of field observation) –

	maximum number Bream Bay Beach at Waipu
australasian gannet	2
black-backed gull	33
caspian tern	2
little shag	1
pied shag	2
red-billed gull	10
variable oystercatcher	10

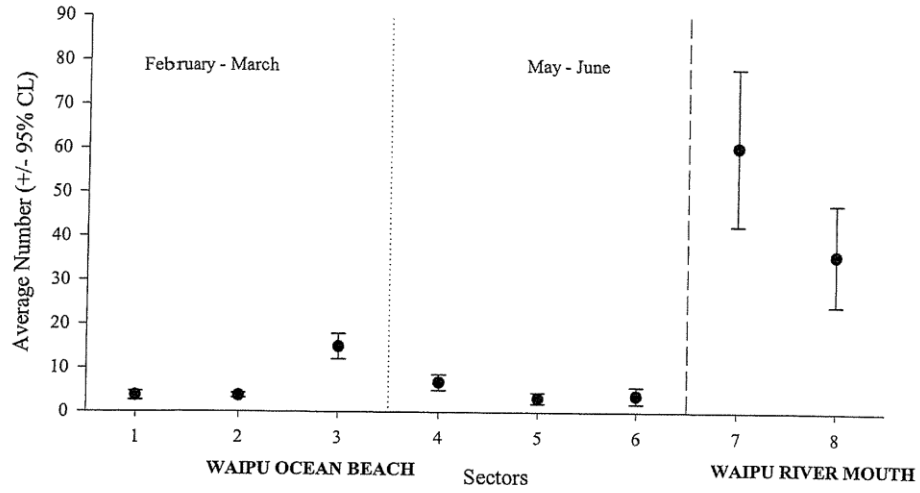
In contrast the diversity, maximum and average numbers were significantly higher at the Waipu River mouth and estuary as illustrated below (Table 4) and that pattern would also apply to Ruakaka River mouth and estuarine habitat.

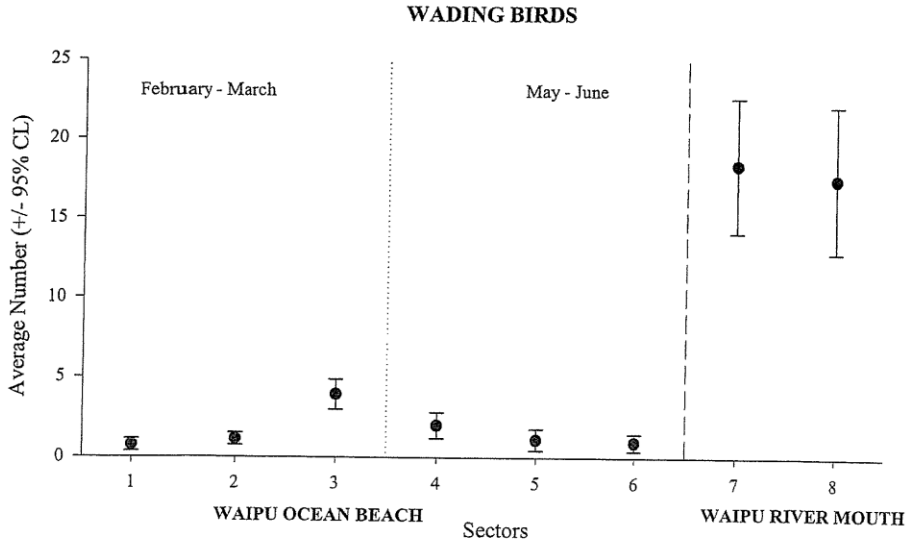
TABLE 4 MAXIMUM NUMBER OF EACH SPECIES RECORDED IN THE WAIPU RIVER MOUTH AREA DURING THE 2007 SURVEYS

	SECTORS 7, 8 (MAY-JUNE)
australasian gannet	2
banded dotterel ●	5
black shag ●	1
caspian tern ●	13
eastern bar-tailed godwit ●	20
grey duck ●	7
little black shag ●	78
little shag	1
mallard	63
masked lapwing	10
NZ kingfisher	1
northern NZ dotterel ●	16
paradise shelduck	2
pied shag ●	22
pied stilt ●	13
red-billed gull ●	9
reef heron ●	1
South Island pied oystercatcher ●	3
southern black-backed gull	9
variable oystercatcher ●	30
white-faced heron	1
white-fronted tern ●	21

● at risk and threatened species (Robertson *et al* 2013)

FIGURE 2 TOTAL BIRDS (ALL SPECIES) AT WAIPU (BIORESEARCHES, 2007)





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3.1.3 Average numbers and percentage occurrence

The average numbers of individual species and the overall population are summarised below for the entire survey area –

TABLE 5 AVERAGE NUMBERS AT BREAM BAY BEACH (MAIR ROAD)

SPECIES	LW +4	LW +5	HW	HW +1	HW +2	HW +3	HW +4	HW +5	LW	Average No.	SE
australasian gannet	1	-	1	4	2	2	1	1	1	1.4	0.4
black-backed gull	1	2	3	-	3	4	7	3	5	3.1	0.7
caspian tern	-	-	-	-	-	-	2	1	-	0.3	0.2
red-billed gull	8	6	4	12	18	4	5	7	8	8.0	1,5
variable oystercatcher	-	-	-	-	1	5	5	3	4	2.0	0.7
white-fronted tern	-	-	-	1	-	-	-	-	-	0.1	0.1
TOTAL	**10**	**8**	**8**	**17**	**24**	**15**	**20**	**15**	**18**	**15.0**	**1.8**

LW + 4 = low water plus 4 hours
SE = standard error of the mean

The overall average of 15.0 individuals over c.2.35 km of coastline compares with 7.46 individuals over c.1.0 km of coastline at Waipu (Bioresearches, 2007) and both are low relative to river mouth and inner Harbour habitats.

The avifauna was dominated by gulls as summarised below based on a total of 135 records –

TABLE 6 BREAM BAY BEACH PERCENTAGE OCCURRENCE SUMMARY

SPECIES	% of the total record
australasian gannet	9.6
black-backed gull	20.7
caspian tern	2.2
red-billed gull	53.3
variable oystercatcher	13.3
white-fronted tern	0.9 (rounded)

A combined 74.0% of the record consisted of black-backed and red-billed gulls and that compares with 70.6% at Waipu (chi-squared – 0.08; no significant difference) but with a relatively higher percentage of australasian gannets (Waipu = 0.4%; chi-squared = 8.5; $p<0.01$) and lower proportion of variable oystercatcher (Waipu = 25.8%; chi-squared = 3.9; $p<0.05$) recorded in this 2015 survey.

Although the Mair Road Bream Bay Beach survey was conducted over one day only, the results appear to accurately characterise the coastal birds in that area when compared with surveys of similar habitat at Waipu (Bioresearches, 2007).

3.1.4 Habitat use

The habitat use data shown in Appendix 5.1. and explained via the key in Section 2 are summarised below.

TABLE 7 BREAM BAY BEACH HABITAT USE SUMMARY

		% habitat use records
FI	feeding in intertidal	8.9
FW	feeding in/over the water	2.9
REI	resting in intertidal	79.3
REW	resting on water	8.9

There was no high tidal roosting by wading birds within the survey area. The high tideline would reach the toe of the foredune on a regular basis, especially during onshore wind and large surf conditions, and the proximity of the narrow strip of beach to the high foredune at other times would not be attractive to wading birds that prefer clear, all-round visibility of their surroundings.

The predominant activity was resting in the intertidal as a result of the dominance of gulls. Resting on the water (gannet, gulls) and feeding in the intertidal were relatively minor activities indicating in particular that this part of Bream Bay Beach is not a key feeding area for wading birds.

A similar proportion of resting in the intertidal habitat was recorded at Waipu (Bioresearches, 2007) – 76.3% (chi-squared = 0.06; no significant difference) but there was a higher proportion of intertidal feeding at Waipu – 21.7% (chi-squared = 5.4; $p<0.05$). The proportion of records of resting on the water was clearly high off the Mair Road area and only 0.1% at Waipu, mainly as a result of a higher occurrence of resting gannets at Mair Road.

3.1.5 Conclusions

The c.2450 m section of Bream Bay Beach in the vicinity of Mair Road comprised typical open coastline habitat that was utilised by a low diversity and relatively low numbers of coastal birds at the time of the survey. It did not contain a high tide roost for waders and was not used by significant numbers of coastal birds for feeding either in its intertidal area or nearshore open water habitat. Overall the habitat for coastal birds is similar to that along c.30 km of Bream Bay from Marsden Point to Bream Tail (excluding Ruakaka and Waipu River mouths and estuaries that have exceptionally high coastal bird values in a national context).

3.2 Mair Bank

The Mair Bank survey areas are shown on Figure 3 and consisted of the "Beach" between the Refinery Jetty and the southeastern point of Marsden Point, the nearshore "Inner Bank" and the two Outer Banks.

The raw data are shown in Appendix 5.2.

In contrast to the surveys of Bream Bay Beach and the Taurikura – McKenzie – Urquharts area, two days of survey were completed at Mair Bank in recognition of its recorded significance as a coastal bird habitat in the literature as summarised in the Phase I report, its location in the context of the Project area and hence the probability of effects, and to provide data that were directly comparable with the 2015 monitoring survey of nearby Marsden Bay that also involves two days of survey.

Figure 3. Mair Bank: Coastal bird survey area

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3.2.1 Tide and weather conditions

The conditions during the two surveys were as follows –

25 February 2015 wind NE to 4 kts, average 2.9 kts, strongest during 1030 to 1330; fine, clear, sunny with cloud from 1030 clearing afternoon.

LW 0720 0.5 m

HW 1337 2.7 m

3 March 2015 : wind E, 5 to 9 kts; average 7.0 kts; generally cloudy with light showers and occasional sunny intervals.

. HW 0657 2.4 m

LW 1305 0.8 m

TABLE 8 AIR TEMPERATURE AND BAROMETRIC PRESSURE

AIR TEMPERATURE (^{o}C)

	n	mean	SD	SE	measured range
25.02.15	9	23.1	1.5	0.5	20.1 – 25.1
03.03.15	9	22.8	0.9	0.3	21.6 – 23.9

BAROMETRIC PRESSURE (hPa)

	n	mean	SD	SE	measured range
25.02.15	9	1012.7	0.5	0.2	1012 – 1013
03.03.15	9	1013.3	0.7	0.2	1012 - 1014

The surveys were completed from 0730 to 1530 hours and 0700 to 1500 hours respectively. The low tides were below average (0.5 m) and above average (0.8 m) with the Marsden Point average low tide for February – March 2015 being 0.7 m. Overall the intertidal habitat exposure reflects the most frequent conditions in terms of the feeding habitat exposure periods.

3.2.2 Species diversity and maximum numbers

The species recorded utilising the survey area during the surveys are as follows; the scientific names and conservation categories are only given if there was no record in Table 2 (Bream Bay Beach).

TABLE 8 SPECIES RECORDED DURING THE MAIR BANK SURVEYS 25 FEBRUARY AND 3 MARCH 2015

COMMON NAMES	SCIENTIFIC NAME
black-backed gull	–
caspian tern •	–
New Zealand dotterel; tuturiwhatu •	*Charadrius obscurus aquilonius*
pied shag; karuhiruhi •	*Phalacrocorax varius varius*
pied stilt; poaka •	*Himantopus himantopus leucocephalus*
red-billed gull •	–
South Island pied oystercatcher; torea •	*Haematopus ostralegus finschi*
variable oystercatcher •	–
white-faced heron	*Egretta novaehollandiae novaehollandiae*

(•species of national conservation concern, Robertson *et al* 2013)

THREATENED SPECIES

caspian tern	:	nationally vulnerable;	SO, Sp
NZ dotterel	:	nationally vulnerable;	CD, Inc
pied shag	:	nationally vulnerable.	
red-billed gull	:	nationally vulnerable.	

AT RISK SPECIES

pied stilt	:	declining;	SO
South Island pied oystercatcher	:	declining.	
variable oystercatcher	:	recovering;	Inc

[SO = secure overseas; Sp = sparse; CD = conservation dependent; Inc = increasing]

In contrast to Bream Bay Beach where only six species were recorded, a total of nine species were utilising Mair Bank; four are considered “threatened” and three “at risk” on a national basis.

The reasons for the ratings for caspian tern, red-billed gull and variable oystercatcher are noted in Section 3.1.2.

The potential factors influencing the other four species using Mair Bank are as follows (Heather & Robertson, 2015; Hitchmough *et al* 2007; Miskelly *et al* 2008; Robertson *et al* 2013; www.nzbirdsoinline.org.nz).

New Zealand dotterel : disturbance and predation at coastal nesting habitats; breeding success increased only at managed breeding sites.

pied shag : often caught in fishing nets and occasionally in hooked lines; previously killed by fishers but now known to have a minimal effect on fish stocks and few are now shot.

pied stilt and
South Island pied oystercatcher : changes in land use especially conversion of sheep farming to dairy farming; weed infestation of oystercatcher breeding habitat.

Table 9 lists the species recorded using Mair Bank and their maximum numbers.

TABLE 9 MAXIMUM NUMBERS RECORDED ON MAIR BANK (ALL SECTORS COMBINED)

	maximum number
black-backed gull	196
caspian tern	2
NZ dotterel	3
pied shag	2
pied stilt	2
red-billed gull	28
South Island pied oystercatcher	6
variable oystercatcher	57
white-faced heron	1

The maxima indicate that the key feature of Mair Bank is the provision of mainly feeding habitat for black-backed gull and variable oystercatcher in particular. During the surveys the Bank was not a key habitat for NZ dotterel or South Island pied oystercatcher. Both are more prevalent in Marsden Bay with 43 NZ dotterel feeding or resting in 2013. On 5.2.13 a total of 73 South Island pied oystercatcher was recorded feeding at low tide and 23 on 12.3.13. Marsden Bay is the key high tide roost for both South Island pied and variable oystercatcher with maxima of 707 and 51 respectively recorded in the 2013 survey (Bioresearches July 2013) with the current survey of Marsden Bay (2015) in preparation.

3.2.3 Average numbers and percentage occurrence

The average numbers of individual species and the populations using Mair Bank are summarised below in the main part of the report for emphasis.

From the 25 February results (Table 10) the dominance of black-backed gulls is clear with an average count of c.100 individuals; that count was roughly 50% on 3 March during a higher low tidal height condition (i.e. significantly lower; chi-squared = 11.6; $p < 0.001$) but the dominance remained. Average numbers of variable oystercatchers were 12.9 and 11.4 respectively (chi-squared) = 0.1; no significant difference) and that average was significantly higher than the maximum number of oystercatchers recorded using the section of Bream Bay Beach. The maximum number of variable oystercatchers recorded using Mair Bank was 57 illustrating the significance of the Bank as a feeding area. The maximum numbers recorded roosting in Marsden Bay over the high tide period were 51 in 2013 and 87 in 2015. (Bioresearches, July 2013 and in prep).

TABLE 10 AVERAGE NUMBERS AT MAIR BANK

(A) 25 FEBRUARY 2015

	TIDAL STAGE										
SPECIES	**LW**	**LW+ 1**	**LW + 2**	**LW + 3**	**LW + 4**	**LW + 5**	**HW**	**HW + 1**	**HW + 2**	**Average No.**	**SE**
blacked-backed gull	194	196	149	96	94	79	-	-	68	97.3	24.1
caspian tern	-	1	-	-	-	1	-	-	1	0.3	0.2
NZ dotterel	3	-	-	-	-	-	-	-	-	0.3	0.3
pied shag	-	-	-	-	-	-	1	1	1	0.3	0.2
pied stilt	1	1	-	1	-	-	-	1	1	0.6	0.2
red-billed gull	28	20	3	1	-	-	-	-	-	5.8	3.5
South Island pied oystercatcher	6	4	-	-	-	-	-	-	-	1.1	0.8
variable oystercatcher	55	57	-	-	-	-	-	2	2	12.9	8.2
white-faced heron	1	1	-	-	-	-	-	-	-	0.2	0.1
TOTAL	**288**	**280**	**152**	**98**	**94**	**80**	**1**	**4**	**73**	**118.9**	**34.8**

TABLE 10 (continued)

(B) 3 MARCH 2015

	TIDAL STAGE										
SPECIES	**HW**	**HW+ 1**	**HW + 2**	**HW + 3**	**HW + 4**	**HW + 5**	**LW**	**LW + 1**	**LW + 2**	**Average No.**	**SE**
blacked-backed gull	36	27	45	44	68	80	89	74	35	55.3	7.5
caspian tern	-	-	1	1	-	-	2	-	-	0.4	0.2
NZ dotterel	1	-	-	-	-	-	-	-	-	0.1	0.1
pied shag	-	-	-	-	-	-	-	-	-	-	-
pied stilt	2	-	-	-	-	-	-	-	-	0.2	0.2
red-billed gull	-	1	3	5	8	13	24	15	6	8.3	2.6
South Island pied oystercatcher	-	-	-	-	-	-	-	-	-	-	-
variable oystercatcher	-	-	2	3	4	23	37	31	3	11.4	4.9
white-faced heron	-	-	-	-	-	-	-	-	-	-	-
TOTAL	**39**	**28**	**51**	**53**	**80**	**116**	**152**	**120**	**44**	**75.9**	**14.5**

If the numbers of black-backed gulls are discounted, the average number of birds (all species) using Mair Bank was relatively low at 21.6 and 20.6 respectively and the maxima were 94 and 63 respectively. In comparison the "grand average" number of wading birds only, using Marsden Bay (2005 to 2013; n = 7) has been 417.1 (SE = 47.9) with a maximum survey average of 563 waders in 2013 (2015 in prep) with peaks at high tide of c.1000 individuals of all species.

Nevertheless, based on the comparative numbers of variable oystercatchers recorded in Marsden Bay (especially roosting at high tide) and feeding on Mair Bank, the Bank is clearly a key feeding habitat for this species in the outer Harbour. That is primarily because the Bank supports a population of pipi (*Paphies australis*) that are predated by variable oystercatchers.

The surveys indicated that the Bank is utilised for feeding predominantly during a four hour period from about four hours after high tide, over the low tide period and to about two hours after low tide i.e. for about one third of a 12 hour tidal cycle. On 25 February "Inner Bank" and the outer banks were water-covered with no birds two hours after low tide. On 3 March the easternmost bank was only just "wadeable" by a few birds at 1115 hours – i.e. about 4.25 hours after high tide; at about two hours after low tide both the "Inner Bank" and outer banks were mostly water-covered.

There was no significant wading bird roost on Marsden Point itself at high tide but it was utilised for resting by up to 80 to 90 black-backed gulls and the occasional caspian tern, red-billed gull and variable oystercatcher.

The percentage occurrences of the nine species recorded are shown below.

TABLE 11 MAIR BANK PERCENTAGE OCCURRENCE SUMMARY

SPECIES	% of the total record
black-backed gull	78.3
caspian tern	0.4
NZ dotterel	0.2
pied shag	0.2
pied stilt	0.4
red-billed gull	7.2
South Island pied oystercatcher	0.6
variable oystercatcher	12.6 (rounded)
white-faced heron	0.1

Mair Bank was dominated by gulls, as was the case at Bream Bay Beach, with essentially the same proportion of variable oystercatchers as Bream Bay Beach. That contrasts with the situation in Marsden Bay where wading birds are the dominant group (Bioresearches 2003 – 2013).

3.2.4 Habitat use

The habitat use summary for Mair Bank is shown in Table 12.

TABLE 12 MAIR BANK HABITAT USE SUMMARY

		% habitat use records
FI	feeding in intertidal	14.9
FW	feeding in/over water	0.2
REI	resting in intertidal	80.4
REW	resting on water	4.5

As at Bream Bay Beach the predominant activity was resting in the intertidal area reflecting the dominance of gulls. There was a lower proportion of feeding in or over the water than at Bream Bay Beach because of the absence of gannets during the surveys at Mair Bank. It is not valid to compare the Mair Bank habitat use records with those from Marsden Bay because (a) they are very different habitat types and (b) there is a significant level of high tide roosting at Marsden Bay that decreases the feeding and resting proportions, and only a relatively low level of resting by gulls at Marsden Point itself (excluding consideration of the RNZ property itself).

Records of all species were as follows over the three areas of Mair Bank that were surveyed -

	% total record
Beach	46.8
Inner Bank	20.2
Two outer banks	33.0

Use of the "beach" habitat is enhanced by the presence of black-backed gulls at high water and the relative significance of the areas within the Mair Bank habitat is best defined by the proportions of feeding records as follows –

	% of feeding (FI, FW) records
Beach	4.5
Inner Bank	18.2
Two outer banks	77.3

Clearly the two outer banks were the most significant feeding habitats within the wider Mair Bank area and that is likely to reflect the presence of significant shellfish beds.

3.2.5 Conclusions

Mair Bank provided habitat for a moderate diversity of birds with nine species; that was higher than the diversity at the Bream Bay Beach site (six species) but significantly lower than that typically present in Marsden Bay e.g. 17 in 2013 (Bioresearches, July 2013).

The total numbers of all species were moderate, but not exceptional, and increased by the large population of black-backed gulls. The total number of waders was relatively low and dominated by variable oystercatcher. The Mair Bank habitat is a locally significant feeding and resting area for black-backed gull that also rest on the beach at Marsden Point itself during high tide periods. However the most significant feature of Mair Bank regarding coastal birds is that it provides a key feeding habitat for variable oystercatcher in this part of the Harbour as a result of the presence of its pipi beds.

The habitat use data indicate that the two outer banks within the wider Mair Bank area are the most utilised areas for feeding with the beach being the least utilised area for feeding.

Mair Bank presents a habitat type for coastal birds, especially variable oystercatcher that is different from both the Bream Bay Beach habitat and the more sheltered habitat in Marsden Bay. Mair Bank is a significant habitat in a national context as a result of its physical and ecological characteristics, including pipi beds, and because it provides a key feeding area for variable oystercatcher in particular and is used by a range of other coastal birds.

3.3 Northern Bays

This section includes the data for the Northern Bays investigated during this survey i.e. Taurikura, McKenzie and Urquharts Bays. The survey was modified to include McKenzie Bay because it was between the two larger Bays and survey visibility was good. The surveys also included a scan of the eastern side of Calliope Island from Urquharts Bay.

The raw data for Taurikura and Urquharts Bays are shown in Appendices 5.3 and 5.4 respectively.

3.3.1 Tide and weather conditions

The conditions during the surveys of the three Bays were as follows –

18 March 2015 : wind NW and W to 4 kts to 1030 hrs then SW to 7 kts (av. 6kts); fine, sunny, scattered cloud with cloud increasing from 1430 hrs.

HW 0614 2.6 m

LW 1223 0.6 m

TABLE 13 AIR TEMPERATURE (^{o}C) AND BAROMETRIC (hPa) PRESSURE

		n	mean	SD	SE	measured range
air temperature		9	20.5	1.7	0.6	18.2 – 22.4
barometric pressure		9	1006.6	0.7	0.2	1005 - 1007

Counts were undertaken between 0730 and 1530 hours (daylight saving time) inclusive. The low tide height was 0.6 m compared with the February – March average for Marsden Point of 0.7 m.

3.3.2 Species diversity and maximum numbers

The species recorded using the three areas are shown in Table 14. Only the common name is used unless it is a species that has not been noted in the lists for Bream Bay Beach and Mair Bank (ref. Tables 2 and 8).

TABLE 14 SPECIES RECORDED IN THE NORTHERN BAYS

	Taurikura	McKenzie	Urquharts
australasian gannet	✓	-	✓
black-backed gull	✓	-	✓
caspian tern ●	✓	✓	✓
little shag; kawaupaka; *Phalacrocorax melanoleucos brevirostris*	✓	-	✓
pied shag ●	✓	-	✓
red-billed gull ●	✓	✓	✓
South Island pied oystercatcher ●	-	-	✓
spur-winged plover; *Vanellus miles novaehollandiae*	✓	-	✓
variable oystercatcher ●	✓	✓	✓
white-faced heron	✓	-	✓
white-fronted tern ●	-	-	✓

(●species of national conservation concern; Robertson *et al* 2013. Refer Tables 2 & 8).

A total of 11 species were recorded at Urquharts Bay compared with 9 at Mair Bay and 17 in Marsden Bay (Bioresearches, July 2013). A total of 9 species were recorded at Taurikura Bay and 3 at McKenzie Bay that is very small in terms of available habitat. Overall a relatively high diversity was recorded considering the limited area of intertidal habitat relative to that on the southern side i.e. Marsden Bay to One Tree Point. Six species were recorded that are "threatened" or "at risk". Those species were also recorded in the Mair Bank – Bream Bay Beach habitat.

The maximum numbers recorded in each Bay are presented below.

TABLE 15 MAXIMUM NUMBERS RECORDED IN THE NORTHERN BAYS

	MAXIMUM NUMBERS		
	Taurikura	**McKenzie**	**Urquharts**
australasian gannet	1	-	2
black-backed gull	3	-	26
caspian tern	2	2	2
little shag	3	-	5
pied shag	1	-	1
red-billed gull	24	2	51
South Island pied oystercatcher	-	-	7
spur-winged plover	9	-	2
variable oystercatcher	3	3	27
white-faced heron	1	-	2
white-fronted tern	-	-	2

In general the maxima were relatively low with the exception of black-backed gull, red-billed gull and variable oystercatcher in Urquharts Bay that presented the largest area of intertidal habitat.

3.3.3 Taurikura Bay

3.3.3.1 Average numbers and percentage occurrence

The numbers of each species and the overall population using the Taurikura Bay habitats (Figure 4) are as follows.

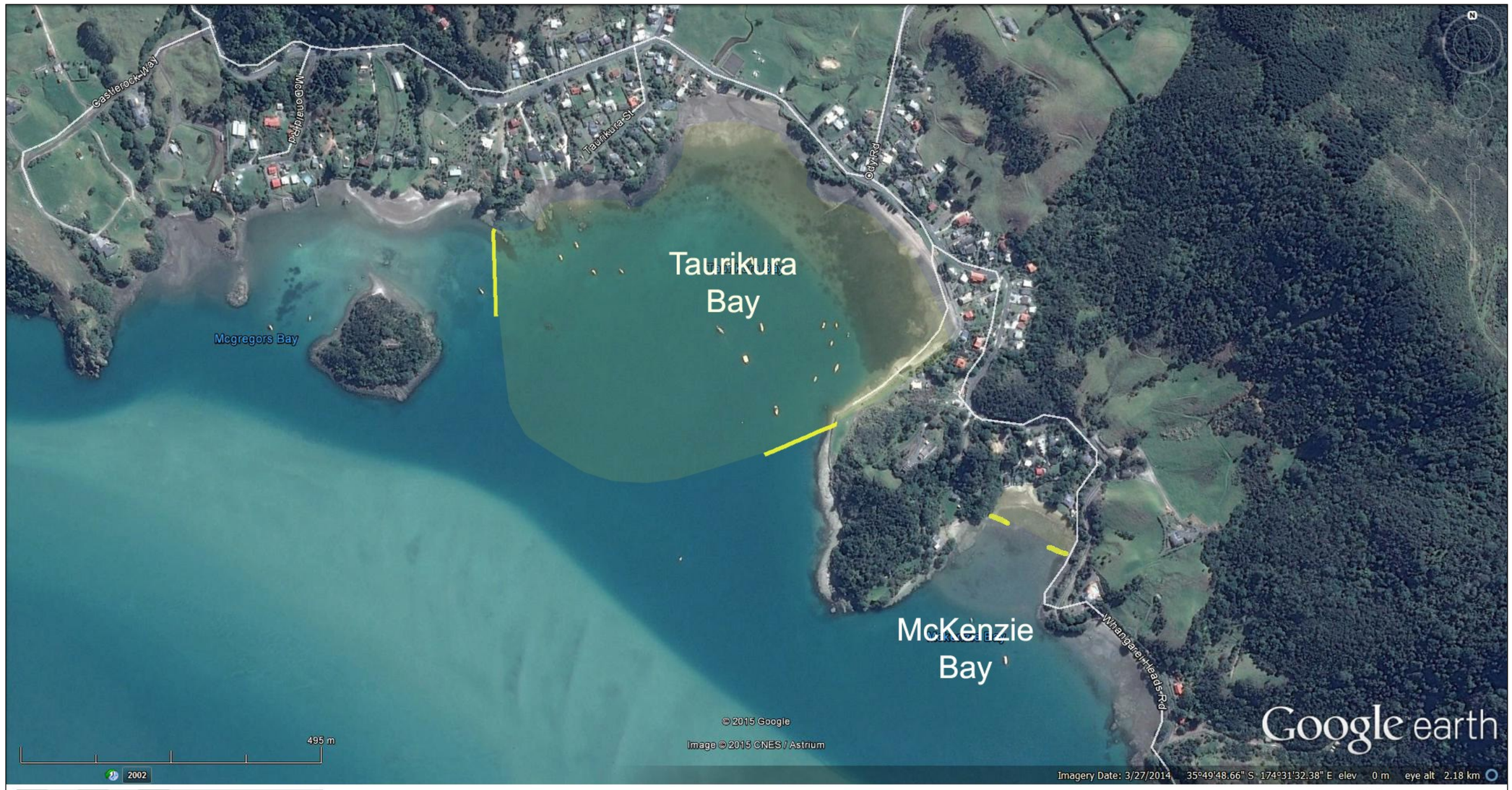

Figure 4. Taurikura and McKenzie Bays: Coastal bird survey areas

BIORESEARCHES
Consulting Biologists - Est. 1972

TABLE 16 AVERAGE NUMBERS AT TAURIKURA BAY

	TIDAL STAGE										
SPECIES	**HW + 1**	**HW + 2**	**HW + 3**	**HW + 4**	**HW + 5**	**LW**	**LW + 1**	**LW + 2**	**LW + 3**	**Average No.**	**SE**
australasian gannet	-	-	-	1	-	1	1	1	1	0.6	0.2
blacked-backed gull	-	-	1	1	1	1	1	-	3	0.9	0.3
caspian tern	-	-	-	-	1	1	2	-	-	0.4	0.2
little shag	-	2	1	-	1	-	2	3	2	1.2	0.4
pied shag	-	-	1	-	1	-	-	-	-	0.2	0.1
red-billed gull	13	16	11	14	21	16	20	24	16	16.8	1.4
spur-winged plover	-	-	9	-	-	-	-	-	-	1.0	1.0
variable oystercatcher	2	-	2	3	2	2	2	2	2	1.9	0.3
white-faced heron	1	-	-	-	1	1	-	-	-	0.3	0.1
TOTAL	**16**	**18**	**25**	**19**	**28**	**22**	**28**	**30**	**24**	**23.3**	**1.6**

Average numbers were very low even for red-billed gull and suggest that Taurikaura Bay does not contain habitat that is especially attractive to coastal birds during about average low tides. Gulls commonly rested at the southern end on an accessway but no significant wading bird roosting or staging was observed.

To allow convenient comparison with the other survey areas the percentage occurrences of the nine species are shown below.

TABLE 17 TAURIKURA BAY PERCENTAGE OCCURRENCE SUMMARY

SPECIES	% of the total record
australasian gannet	2.4
black-backed gull	3.8
caspian tern	1.9
little shag	5.2
pied shag	0.9
red-billed gull	71.9
spur-winged plover	4.3
variable oystercatcher	8.1
white-faced heron	1.5 (rounded)

In contrast to Mair Bank that was dominated by black-backed gull, Taurikura Bay's dominant species was red-billed gull with the remaining species being relatively incidental in ecological terms. A point of difference was the use of the Bay for both roosting and feeding by little shags. The proportion of wading birds (including spur-winged plover) was 13.9% and 5.8% excluding spur-winged plover. The percentage of wading birds using Mair Bank was also 13.9%.

3.3.3.2 Habitat use

The habitat use summary for Taurikura Bay based on the total record of observations is shown below in Table 18.

TABLE 18 TAURIKURA BAY HABITAT USE SUMMARY

		% habitat use records
FI	feeding in intertidal	13.8
FW	feeding in/over the water	3.8
REI	resting in intertidal	77.1
ROP	resting/roosting on stakes, poles, rock walls, trees, boats	5.3

As at Bream Bay Beach and Mair Bank, resting in the intertidal area was the predominant activity, increased by the predominance of red-billed gulls. As noted above a difference was the presence of little shags and that is reflected by a 5.3% incidence of roosting, mainly on fringing pohutukawa trees.

3.3.3.3 Conclusions

Although a relatively moderate diversity of coastal birds was recorded, considering the habitats available, numbers were low and dominated by red-billed gull. No significant intertidal feeding habitats were present, even on a local basis and, overall, Taurikura Bay was not an especially notable habitat for coastal birds with the possible exception of little shags. In the context of the local northern shoreline it was not a significant coastal bird habitat.

3.3.4 McKenzie Bay

The data for McKenzie Bay are presented in full below. The Bay presents a relatively small area of habitat and that was reflected in the low numbers recorded.

TABLE 19 McKENZIE BAY COASTAL BIRD RESULTS

18 March 2015

HW	+ 1 hr	0730	no birds	
	+ 2 hrs	0830	no birds	
	+ 3 hrs	0930	no birds	
	+ 4 hrs	1030	2 x variable oystercatchers	REI
	+ 5 hrs	1130	1 x variable oystercatcher	REI
LW		1230	2 x variable oystercatchers	FI
	+ 1 hr	1330	2 x variable oystercatchers	FI
			1 x variable oystercatcher	REI
LW	+ 2 hrs	1430	2 x variable oystercatchers	FI
			1 x variable oystercatcher	REI
LW	+ 3 hrs	1530	2 x red-billed gull	REI
			2 x caspian tern	REI
			2 x variable oystercatchers	REI

Although numbers were low, three species were recorded of which two are "threatened" and one is "at risk". Birds were consistently present from four hours after high tide to at least half tide rising with resting the main activity.

3.3.5 Urquharts Bay

3.3.5.1 Average numbers and percentage occurrence

The numbers of the species and coastal bird population using the Urquharts Bay habitats (Figure 5) are as follows –

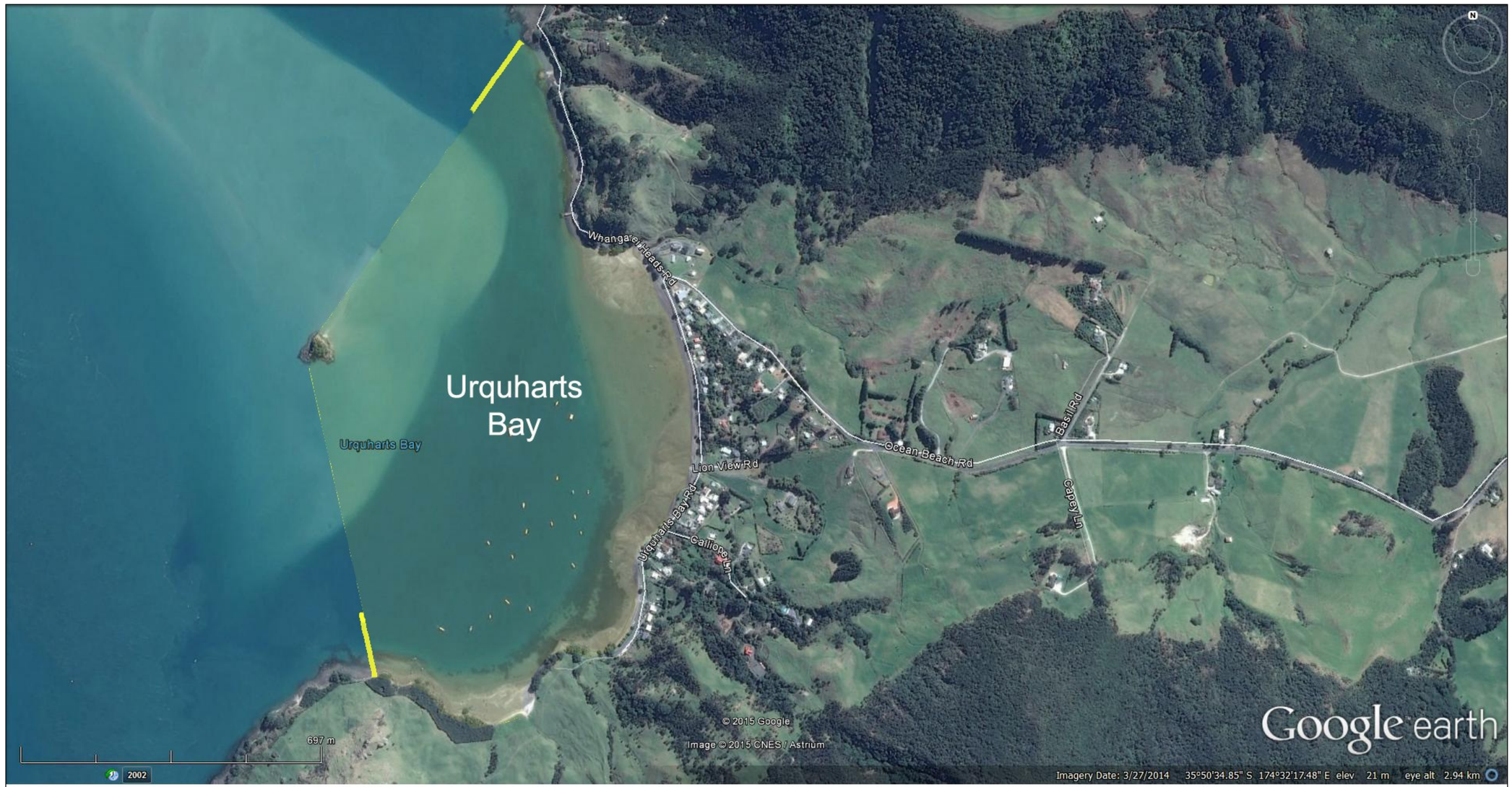

Figure 5. Urquharts Bay: Coastal bird survey area

TABLE 20 AVERAGE NUMBERS AT URQUHARTS BAY

	TIDAL STAGE										
SPECIES	**HW + 1**	**HW + 2**	**HW + 3**	**HW + 4**	**HW + 5**	**LW**	**LW + 1**	**LW + 2**	**LW + 3**	**Average No.**	**SE**
australasian gannet	-	1	1	2	-	1	-	-	-	0.6	0.2
blacked-backed gull	1	9	6	22	21	20	23	26	17	16.1	2.9
caspian tern	-	-	1	2	1	1	1	1	1	0.9	0.2
little shag	-	-	3	5	-	2	5	2	-	1.9	0.7
pied shag	-	-	-	-	-	-	-	1	-	0.1	0.1
red-billed gull	27	25	28	25	40	51	42	39	40	35.2	3.1
South Island pied oystercatcher	-	-	4	1	-	5	7	3	-	2.2	0.9
spur-winged plover	-	-	-	-	2	-	-	-	-	0.2	0.2
variable oystercatcher	7	13	16	26	27	15	21	17	20	18.0	2.1
white-faced heron	2	-	-	2	2	1	2	1	1	1.2	0.3
white-fronted tern	-	-	-	-	2	2	2	-	-	0.7	0.3
TOTAL	**37**	**48**	**59**	**85**	**95**	**98**	**103**	**90**	**79**	**77.1**	**7.9**

The overall average number for all species was relatively high and about three times that recorded in Taurikura Bay but was similarly dominated by red-billed gull. Subdominant species were variable oystercatcher and black-backed gull with both species being significantly more common than in Taurikura Bay. Little shags were again frequent as at Taurikura Bay. The number of variable oystercatcher feeding in the intertidal area, especially at the northern end of the Bay (to the south of the wharf) was relatively high, and a low number of South Island pied oystercatchers was also present. Both caspian tern and white-faced heron were frequent. There was no large wading bird roost evident but a well-used resting area for gulls (and white-fronted tern) was present to the south of the boat ramp.

The percentage occurrence of the eleven species is shown in Table 21 below.

TABLE 21 URQUHARTS BAY PERCENTAGE OCCURRENCE SUMMARY

SPECIES	% of the total record
australasian gannet	0.7
black-backed gull	20.9
caspian tern	1.2
little shag	2.4
pied shag	0.1
red-billed gull	45.7
South Island pied oystercatcher	2.9
spur-winged plover	0.3
variable oystercatcher	23.3
white-faced heron	1.6
white-fronted tern	0.9

A total of 66.6% of the record was of gulls compared with 75.7% at Taurikura Bay (with significantly lower numbers) but the percentage (and average number) of variable oystercatchers was higher at Urquharts Bay (chi-squared = 7.4; $p<0.01$). The proportion of wading birds was 28.1% and that was higher than at both Taurikura Bay and Mair Bank (chi-squared = 4.8; $p<0.05$).

Overall, Urquharts Bay was a locally significant habitat for a moderate diversity of coastal birds. It provides attractive feeding habitat for variable and South Island pied oystercatchers and is in close proximity to the Mair Bank feeding areas.

3.3.5.2 Habitat use

The habitat use summary for Urquharts Bay is shown below –

		% habitat use records
FI	feeding in intertidal	18.9
FW	feeding in/over the water	2.0
REI	resting in intertidal	76.1
REW	resting on the water	0.7
ROP	resting/roosting on stakes, poles, rock walls, trees, boats	2.3

The proportions of feeding and resting/roosting were similar to those at the other survey areas and mainly reflective of the numerical dominance of gulls. On a proportional basis, wading birds were most dominant at Urquharts Bay. The comparative summary of activities and the proportion of wading birds is shown below –

TABLE 23 PROPORTIONS OF FEEDING, RESTING/ROOSTING AND WADING BIRDS IN THE FOUR MAIN SURVEY AREAS

	Bream Bay Beach	Mair Bank	Taurikura Bay	Urquharts Bay
% feeding	11.8	15.1	17.6	20.9
% resting/roosting	88.2	84.9	82.4	79.1
% wading birds	13.3	13.7	13.9	28.1
% gulls	74.0	85.5	75.7	66.6

The proportions of waders were the same at Bream Bay Beach, Mair Bank and Taurikura but higher at Urquharts Bay (chi-squared = 9.0; $p<0.01$) while the proportions of gulls (i.e. black-backed plus red-billed gull) were similar (chi-squared = 2.3; not significant) throughout.

While the proportions of feeding birds were not significantly different at the 95% level (chi-squared = 2.7) there was a strong inference that feeding was more prominent at Urquharts Bay ($p<0.1$) as a result of its large proportion of wading birds.

3.3.5.3 Conclusions

Urquharts Bay presented a range of habitats that were utilised by a high number and high diversity of coastal birds relative to nearby Taurikura Bay. In particular there were notable numbers of red-billed gulls and feeding variable oystercatchers. The Bay is a locally significant habitat for coastal birds only and is in close proximity to the Mair Bank feeding habitats.

4 SUMMARY AND CONCLUSIONS

4.1. The diversity of coastal birds and the occurrence of species with national conservation ratings were variable between survey areas and are summarised as follows:

Site	Total species	Threatened species	At Risk species	Total Threatened and At Risk
Bream Bay Beach	6	2	2	4
Mair Bank	9	4	3	7
Taurikura Bay	9	3	1	4
McKenzie Bay	3	2	1	3
Urquharts Bay	11	3	3	6

4.2 The diversity in the survey areas was low to moderate. However, different habitat types are involved and for that reason the lower diversity was not unexpected. In comparison with other proximate areas surveyed, the coastal bird diversity at the Waipu River Mouth was 22 species (Bioresearches, 2007) and the total diversity at Marsden Bay based on all surveys is 24 species (Bioresearches 2015 in prep).

4.3 Examining the various sites surveyed, the section of Bream Bay Beach comprised typical open coastline habitat that was utilised by a low diversity and relatively low numbers of coastal birds. No high tide roost was present and overall the habitat is similar to c. 30 km of beach habitat between Marsden Point and Bream Tail (excluding Ruakaka and Waipu River mouths and estuaries that have exceptional values in a national context).

4.4 Mair Bank was a locally significant feeding and resting area for black-backed gull but its most significant feature is that it provided a key feeding habitat for variable oystercatcher as a result of its pipi beds. Overall it is a significant habitat in a national context.

4.5 Taurikura Bay did not contain significant intertidal feeding habitats or a notable high tide roost. In the context of the local northern shoreline it was not a significant coastal bird habitat.

4.6 McKenzie Bay provides limited habitat and is not a notable area for coastal birds relative to adjacent areas.

4.7 Urquharts Bay supported a relatively diverse avifauna and is a significant habitat for birds on a local basis i.e. in the context of the coastline to the east of Lort Point. It provided feeding habitat for notable numbers of variable oystercatchers, resting areas for red-billed gull and is in close proximity to the Mair Bank feeding habitats.

4.8 The present survey has provided data on diversity, abundance and habitat use during the February – March 2015 period. Previously the information base (refer Phase I report) was more general although it had identified the species present, key areas in the context of Whangarei Harbour and breeding activity. The only comparable local data is that from the long-term monitoring at Marsden Bay. There are no equivalent long-term data for any of the other habitats in the Whangarei Heads area. The current survey represents a robust database and in tandem with proposed breeding season surveys provides a reliable assessment of coastal bird habitat use together with the species and numbers involved.

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Department of Conservation.

6 APPENDICES

Appendix 6.1

Bream Bay Beach Field Data – 23.3.15

BREAM BAY BEACH COASTAL BIRD COUNT RESULTS 2015

DATE : 23.3.15 **TIME (hrs) : 0900** **TIDAL STATE : c.LW + 4 hrs**

TIDE TIME ; HEIGHT : LW 0424; 0.3 m **AIR TEMP (^{o}C) : 18.1**

BARO. PRESSURE (hPa) : 1017 **WIND (knots) : NW to 3 kts**

WEATHER : light showers.

	NORTH	SOUTH
australasian gannet		1 FW
black-backed gull	1 FI	
caspian tern		
red-billed gull	3 REI	5 REI
variable oystercatcher		
white-fronted tern		

No pelagic species offshore.
18 crab pot buoys off Mair Road.

BREAM BAY BEACH COASTAL BIRD COUNT RESULTS 2015

DATE : 23.3.15 **TIME (hrs) : 1000** **TIDAL STATE : c.LW + 5 hrs**

TIDE TIME ; HEIGHT : LW 0424; 0.3 m **AIR TEMP (^{o}C) : 18.8**

BARO. PRESSURE (hPa) : 1018 **WIND (knots) : NW to 2 kts**

WEATHER : cloudy; scattered showers.

	NORTH	SOUTH
australasian gannet		
black-backed gull		1 REW; 1 FI
caspian tern		
red-billed gull	4 REI	2 REI
variable oystercatcher		
white-fronted tern		

No pelagic species offshore.

BREAM BAY BEACH COASTAL BIRD COUNT RESULTS 2015

DATE : 23.3.15 **TIME (hrs) : 1100** **TIDAL STATE : c.HW**

TIDE TIME ; HEIGHT : HW 1042; 2.9 m **AIR TEMP (^{o}C) : 19.3**

BARO. PRESSURE (hPa) : 1018 **WIND (knots) : NW to 3 kts**

WEATHER : as prev.

	NORTH	SOUTH
australasian gannet	1 FW	
black-backed gull		3 REI
caspian tern		
red-billed gull	4 REI	
variable oystercatcher		
white-fronted tern		

No pelagic species offshore.
Two gannets in main Harbour channel.

BREAM BAY BEACH COASTAL BIRD COUNT RESULTS 2015

DATE : 23.3.15 **TIME (hrs) : 1200** **TIDAL STATE : c.HW + 1 hr**

TIDE TIME ; HEIGHT : HW 1042; 2.9 m **AIR TEMP (^{o}C) : 19.8**

BARO. PRESSURE (hPa) : 1018 **WIND (knots) : NW <1 kt**

WEATHER : cloudy; showers clearing.

	NORTH	SOUTH
australasian gannet	3 REW	1 REW
black-backed gull		
caspian tern		
red-billed gull	12 REI	
variable oystercatcher		
white-fronted tern		1 FW

1210 **pelagic species in outer channel; disturbed by timber ship entering.**
1240 **4 x "shearwaters" (?) off Busby Head flew towards Hen & Chickens Islands.**

BREAM BAY BEACH COASTAL BIRD COUNT RESULTS 2015

DATE : 23.3.15 **TIME (hrs) : 1300** **TIDAL STATE : c.HW + 2 hrs**

TIDE TIME ; HEIGHT : HW 1042; 2.9 m **AIR TEMP (^{o}C) : 23.7**

BARO. PRESSURE (hPa) : 1017 **WIND (knots) : NE to 2 kts**

WEATHER : dry; sunny with cloud; sea flat.

	NORTH	SOUTH
australasian gannet	1 REW	1 REW
black-backed gull		3 REI
caspian tern		
red-billed gull	18 REI	
variable oystercatcher	1 REI	
white-fronted tern		

BREAM BAY BEACH COASTAL BIRD COUNT RESULTS 2015

DATE : 23.3.15 **TIME (hrs) : 1400** **TIDAL STATE : c.HW + 3 hrs**

TIDE TIME ; HEIGHT : HW 1042; 2.9 m **AIR TEMP (^{o}C) : 23.4**

BARO. PRESSURE (hPa) : 1016 **WIND (knots) : NE to 3 kts**

WEATHER : as prev.

	NORTH	SOUTH
australasian gannet	1 REW	1 REW
black-backed gull	2 REI	2 REI
caspian tern		
red-billed gull	4 REI	
variable oystercatcher	5 REI	
white-fronted tern		

– 1 x arctic skua flying through survey area.

– variable oystercatchers flying along the beach from Ruakaka to Marsden Point.

BREAM BAY BEACH COASTAL BIRD COUNT RESULTS 2015

DATE : 23.3.15 **TIME (hrs) : 1500** **TIDAL STATE : c.HW + 4 hrs**

TIDE TIME ; HEIGHT : HW 1042; 2.9 m **AIR TEMP (^{o}C) : 23.6**

BARO. PRESSURE (hPa) : 1016 **WIND (knots) : NE to 5 kts**

WEATHER : cloud increasing.

	NORTH	SOUTH
australasian gannet	1 REW	
black-backed gull	1 FI; 3 REI	3 REI
caspian tern	1 REI	1 FW
red-billed gull		5 REI
variable oystercatcher	3 FI	1 FI; 1 REI
white-fronted tern		

1445 Mair Bank just emerging with birds feeding.

BREAM BAY BEACH COASTAL BIRD COUNT RESULTS 2015

DATE : 23.3.15 **TIME (hrs) : 1600** **TIDAL STATE : c.HW + 5 hrs**

TIDE TIME ; HEIGHT : HW 1042; 2.9 m **AIR TEMP (^{o}C) : 21.7**

BARO. PRESSURE (hPa) : 1015 **WIND (knots) : NE to 5 kts**

WEATHER : sunny; cloud clearing.

	NORTH	SOUTH
australasian gannet	1 REW	
black-backed gull	1 REI	2 REI
caspian tern		1 REI
red-billed gull	5 REI	2 REI
variable oystercatcher	2 FI	1 FI
white-fronted tern		

BREAM BAY BEACH COASTAL BIRD COUNT RESULTS 2015

DATE : 23.3.15 **TIME (hrs) : 1700** **TIDAL STATE : c.LW**

TIDE TIME ; HEIGHT : LW 1652; 0.2 m **AIR TEMP (^{o}C) : 23.3**

BARO. PRESSURE (hPa) : 1015 **WIND (knots) : NE to 4 kts**

WEATHER : as prev.

	NORTH	SOUTH
australasian gannet	1 REW	
black-backed gull		5 REI
caspian tern		
red-billed gull	7 REI	1 REI
variable oystercatcher	2 FI	2 REI
white-fronted tern		

Appendix 6.2

Mair Bank Field Data – 25.2.15 and 3.3.15

MAIR BANK COASTAL BIRD COUNT RESULTS 2015

DATE : 25.2.15 **TIME (hrs) : 0730** **TIDAL STATE : c.LW**

TIDE TIME ; HEIGHT : LW 0720; 0.5 m **AIR TEMP (^{o}C) : 20.1**

BARO. PRESSURE (hPa) : 1012 **WIND (knots) : NE to 2 kts**

WEATHER : fine, clear, sunny.

	BEACH (REFINERY JETTY TO SE POINT)	INNER BANK	TWO OUTER BANKS
black-backed gull	1 REI	60 REI 5 FI 18 REWI	90 REI 20 FI
caspian tern			
N.Z. dotterel	3 FI		
pied shag			
pied stilt	1 FI		
red-billed gull		16 REI 8 FI	4 FI
South Island pied oystercatcher			6 FI
variable oystercatcher		7 FI 1 REI	47 FI
white-faced heron	1 FI		

MAIR BANK COASTAL BIRD COUNT RESULTS 2015

DATE : 25.2.15 **TIME (hrs) : 0830** **TIDAL STATE : c.LW + 1 hr**

TIDE TIME ; HEIGHT : LW 0720; 0.5 m **AIR TEMP (^{o}C) : 22.2**

BARO. PRESSURE (hPa) : 1012 **WIND (knots) : NE to 1 kt**

WEATHER : as prev.

	BEACH (REFINERY JETTY TO SE POINT)	INNER BANK	TWO OUTER BANKS
black-backed gull		76 REI	116 REI 4 REW
caspian tern		1 REI	
N.Z. dotterel			
pied shag			
pied stilt		1 FI	
red-billed gull		19 REI 1 FI	
South Island pied oystercatcher			4 FI
variable oystercatcher		10 FI 2 REI	45 FI
white-faced heron	1 F		

MAIR BANK COASTAL BIRD COUNT RESULTS 2015

DATE : 25.2.15 **TIME (hrs) : 0930** **TIDAL STATE : c.LW + 2 hrs**

TIDE TIME ; HEIGHT : LW 0720; 0.5 m **AIR TEMP (^{o}C) : 22.5**

BARO. PRESSURE (hPa) : 1013 **WIND (knots) : NE to 4 kts**

WEATHER : as prev.

	BEACH (REFINERY JETTY TO SE POINT)	INNER BANK	TWO OUTER BANKS
black-backed gull	149 REI		
caspian tern			
N.Z. dotterel			
pied shag		NO BIRDS – WATER COVERED	NO BIRDS – WATER COVERED
pied stilt			
red-billed gull	3 REI		
South Island pied oystercatcher			
variable oystercatcher			
white-faced heron			

MAIR BANK COASTAL BIRD COUNT RESULTS 2015

DATE : 25.2.15 **TIME (hrs) : 1030** **TIDAL STATE : c.LW + 3 hrs**

TIDE TIME ; HEIGHT : LW 0720; 0.5 m **AIR TEMP (^{o}C) : 22.7**

BARO. PRESSURE (hPa) : 1013 **WIND (knots) : NE to 4 kts**

WEATHER : sunny with cloud.

	BEACH (REFINERY JETTY TO SE POINT)	INNER BANK	TWO OUTER BANKS
black-backed gull	96 REI		
caspian tern			
N.Z. dotterel		NO BIRDS	NO BIRDS
pied shag			
pied stilt	1 FI		
red-billed gull	1 REI		
South Island pied oystercatcher			
variable oystercatcher			
white-faced heron			

MAIR BANK COASTAL BIRD COUNT RESULTS 2015

DATE : 25.2.15 **TIME (hrs) : 1130** **TIDAL STATE : c.LW + 4 hrs**

TIDE TIME ; HEIGHT : LW 0720; 0.5 m **AIR TEMP (^{o}C) : 23.4**

BARO. PRESSURE (hPa) : 1013 **WIND (knots) : NE to 4 kts**

WEATHER : as prev.

	BEACH (REFINERY JETTY TO SE POINT)	INNER BANK	TWO OUTER BANKS
black-backed gull	94 REI		
caspian tern			
N.Z. dotterel			
pied shag		NO BIRDS	NO BIRDS
pied stilt			
red-billed gull			
South Island pied oystercatcher			
variable oystercatcher			
white-faced heron			

MAIR BANK COASTAL BIRD COUNT RESULTS 2015

DATE : 25.2.15 **TIME (hrs) : 1230** **TIDAL STATE : c.LW + 5 hrs**

TIDE TIME ; HEIGHT : LW 0720; 0.5 m **AIR TEMP (^{o}C) : 22.8**

BARO. PRESSURE (hPa) : 1013 **WIND (knots) : NE to 4 kts**

WEATHER : cloud clearing; fine; sunny.

	BEACH (REFINERY JETTY TO SE POINT)	INNER BANK	TWO OUTER BANKS
black-backed gull	79 REI		
caspian tern	1 REI		
N.Z. dotterel			
pied shag		NO BIRDS	NO BIRDS
pied stilt			
red-billed gull			
South Island pied oystercatcher			
variable oystercatcher			
white-faced heron			

MAIR BANK COASTAL BIRD COUNT RESULTS 2015

DATE : 25.2.15 **TIME (hrs) : 1330** **TIDAL STATE : c.HW**

TIDE TIME ; HEIGHT : HW 1337; 2.7 m **AIR TEMP (^{o}C) : 23.9**

BARO. PRESSURE (hPa) : 1013 **WIND (knots) : NE to 4 kts**

WEATHER : as prev.

	BEACH (REFINERY JETTY TO SE POINT)	INNER BANK	TWO OUTER BANKS
black-backed gull			
caspian tern			
N.Z. dotterel			
pied shag	1 FW	NO BIRDS	NO BIRDS
pied stilt			
red-billed gull			
South Island pied oystercatcher			
variable oystercatcher			
white-faced heron			

1315 black-backed gulls displaced by jogger to 700 m offshore in mid-channel.
1345 black-backed gulls (81) displaced by boat and moved to be over outer banks.

MAIR BANK COASTAL BIRD COUNT RESULTS 2015

DATE : 25.2.15 **TIME (hrs) : 1430** **TIDAL STATE : c.HW + 1 hr**

TIDE TIME ; HEIGHT : HW 1337; 2.7 m **AIR TEMP (^{o}C) : 24.8**

BARO. PRESSURE (hPa) : 1013 **WIND (knots) : NE to 1 kt**

WEATHER : as prev.

	BEACH (REFINERY JETTY TO SE POINT)	INNER BANK	TWO OUTER BANKS
black-backed gull			
caspian tern			
N.Z. dotterel			
pied shag		1 FW	NO BIRDS
pied stilt	1 FI		
red-billed gull			
South Island pied oystercatcher			
variable oystercatcher	1 REI 1 FI		
white-faced heron			

1400 : black-backed gull (81) have drifted to south beyond outer bank.

MAIR BANK COASTAL BIRD COUNT RESULTS 2015

DATE : 25.2.15 **TIME (hrs) : 1530** **TIDAL STATE : c.HW + 2 hrs**

TIDE TIME ; HEIGHT : HW 1337; 2.7 m **AIR TEMP (°C) : 25.1**

BARO. PRESSURE (hPa) : 1012 **WIND (knots) : NE to 2 kts**

WEATHER : as prev.

	BEACH (REFINERY JETTY TO SE POINT)	INNER BANK	TWO OUTER BANKS
black-backed gull	68 REI		
caspian tern	1 REI		
N.Z. dotterel			
pied shag	1 FW	1 FW	NO BIRDS
pied stilt	1 FI		
red-billed gull			
South Island pied oystercatcher			
variable oystercatcher	2 REI		
white-faced heron			

1500 : black-backed gull on beach disturbed by walker – sitting water south of banks – returned beach at 1519.

MAIR BANK COASTAL BIRD COUNT RESULTS 2015

DATE : 3.3.15 **TIME (hrs) : 0700** **TIDAL STATE : c.HW**

TIDE TIME ; HEIGHT : HW 0657 2.4 m **AIR TEMP (^{o}C) : 21.6**

BARO. PRESSURE (hPa) : 1012 **WIND (knots) : E to 5 kts**

WEATHER : cloudy; squally rain showers to north.

	BEACH (REFINERY JETTY TO SE POINT)	INNER BANK	TWO OUTER BANKS
black-backed gull	36 REI		
caspian tern			
N.Z. dotterel	1 REI		
pied shag		NO BIRDS	NO BIRDS
pied stilt	2 FI		
red-billed gull			
South Island pied oystercatcher			
variable oystercatcher			
white-faced heron			

1 x arctic skua flying over Bank.

MAIR BANK COASTAL BIRD COUNT RESULTS 2015

DATE : 3.3.15 **TIME (hrs) : 0800** **TIDAL STATE : c.HW + 1 hr**

TIDE TIME ; HEIGHT : HW 0657 2.4 m **AIR TEMP (^{o}C) : 21.9**

BARO. PRESSURE (hPa) : 1013 **WIND (knots) : E to 6 kts**

WEATHER : as prev.

	BEACH (REFINERY JETTY TO SE POINT)	INNER BANK	TWO OUTER BANKS
black-backed gull	27 REI		
caspian tern			
N.Z. dotterel			
pied shag		NO BIRDS	NO BIRDS
pied stilt			
red-billed gull	1 REI		
South Island pied oystercatcher			
variable oystercatcher			
white-faced heron			

MAIR BANK COASTAL BIRD COUNT RESULTS 2015

DATE : 3.3.15 **TIME (hrs) : 0900** **TIDAL STATE : c.HW + 2 hrs**

TIDE TIME ; HEIGHT : HW 0657 2.4 m **AIR TEMP (^{o}C) : 21.9**

BARO. PRESSURE (hPa) : 1014 **WIND (knots) : E to 9 kts**

WEATHER : cloudy and showers.

	BEACH (REFINERY JETTY TO SE POINT)	INNER BANK	TWO OUTER BANKS
black-backed gull	45 REI		
caspian tern	1 REI		
N.Z. dotterel			
pied shag		NO BIRDS	NO BIRDS
pied stilt			
red-billed gull	3 REI		
South Island pied oystercatcher			
variable oystercatcher	2 REI		
white-faced heron			

MAIR BANK COASTAL BIRD COUNT RESULTS 2015

DATE : 3.3.15 **TIME (hrs) : 1000** **TIDAL STATE : c.HW + 3 hrs**

TIDE TIME ; HEIGHT : HW 0657 2.4 m **AIR TEMP (°C) : 22.4**

BARO. PRESSURE (hPa) : 1014 **WIND (knots) : E to 7 kts**

WEATHER : as prev.

	BEACH (REFINERY JETTY TO SE POINT)	INNER BANK	TWO OUTER BANKS
black-backed gull	44 REI		
caspian tern	1 REI		
N.Z. dotterel			
pied shag		NO BIRDS	NO BIRDS
pied stilt			
red-billed gull	5 REI		
South Island pied oystercatcher			
variable oystercatcher	3 REI		
white-faced heron			

Inner and Outer Banks water-covered.

MAIR BANK COASTAL BIRD COUNT RESULTS 2015

DATE : 3.3.15 **TIME (hrs) : 1100** **TIDAL STATE : c.HW + 4 hrs**

TIDE TIME ; HEIGHT : HW 0657 2.4 m **AIR TEMP (^{o}C) : 23.9**

BARO. PRESSURE (hPa) : 1014 **WIND (knots) : E to 7 kts**

WEATHER : as prev.

	BEACH (REFINERY JETTY TO SE POINT)	INNER BANK	TWO OUTER BANKS
black-backed gull	68 REI		
caspian tern			
N.Z. dotterel			
pied shag		NO BIRDS	NO BIRDS
pied stilt			
red-billed gull	8 REI		
South Island pied oystercatcher			
variable oystercatcher	4 REI		
white-faced heron			

1030 : 1 x gannet outer bank area.
1115 : 3 x black-backed gull and 1 x VO sanding on outer bank east.

MAIR BANK COASTAL BIRD COUNT RESULTS 2015

DATE : 3.3.15 **TIME (hrs) : 1200** **TIDAL STATE : c.HW + 5 hrs**

TIDE TIME ; HEIGHT : HW 0657 2.4 m **AIR TEMP (^{o}C) : 23.7**

BARO. PRESSURE (hPa) : 1014 **WIND (knots) : E to 9 kts**

WEATHER : sunny intervals.

	BEACH (REFINERY JETTY TO SE POINT)	INNER BANK	TWO OUTER BANKS
black-backed gull	26 REI	1 FI	17 FI 36 REW
caspian tern			
N.Z. dotterel			
pied shag			
pied stilt			
red-billed gull	10 REI	1 FI	2 FI
South Island pied oystercatcher			
variable oystercatcher	3 REI	2 FI	18 FI
white-faced heron			

MAIR BANK COASTAL BIRD COUNT RESULTS 2015

DATE : 3.3.15 **TIME (hrs) :1300** **TIDAL STATE : c.LW**

TIDE TIME ; HEIGHT LW 1305; 0.8 m **AIR TEMP (°C) : 23.4**

BARO. PRESSURE (hPa) : 1013 **WIND (knots) : E to 6 kts**

WEATHER : cloud increasing.

	BEACH (REFINERY JETTY TO SE POINT)	INNER BANK	TWO OUTER BANKS
black-backed gull	4 REI	31 REI 4 FI	35 REI 9 REW 6 FI
caspian tern		1 REI	1 REI
N.Z. dotterel			
pied shag			
pied stilt			
red-billed gull	1 REI	12 REI 6 FI	5 FI
South Island pied oystercatcher			
variable oystercatcher	1 REI	5 FI	31 FI
white-faced heron			

MAIR BANK COASTAL BIRD COUNT RESULTS 2015

DATE : 3.3.15 **TIME (hrs) : 1400** **TIDAL STATE : c.LW + 1 hr**

TIDE TIME ; HEIGHT : LW 1305; 0.8 m **AIR TEMP (^{o}C) : 23.6**

BARO. PRESSURE (hPa) : 1013 **WIND (knots) : E to 8 kts**

WEATHER : occ. light shower and sunny intervals.

	BEACH (REFINERY JETTY TO SE POINT)	INNER BANK	TWO OUTER BANKS
black-backed gull	1 REI	35 REI 1 FI	29 REI 1 FI 7 REW
caspian tern			
N.Z. dotterel			
pied shag			
pied stilt			
red-billed gull	8 REI	3 FI	4 FI
South Island pied oystercatcher			
variable oystercatcher		2 FI	29 FI
white-faced heron			

MAIR BANK COASTAL BIRD COUNT RESULTS 2015

DATE : 3.3.15 **TIME (hrs) : 1500** **TIDAL STATE : c.LW + 2 hrs**

TIDE TIME ; HEIGHT : LW 1305; 0.8 m **AIR TEMP (^{o}C) : 23.2**

BARO. PRESSURE (hPa) : 1013 **WIND (knots) : E to 6 kts**

WEATHER : as prev.

	BEACH (REFINERY JETTY TO SE POINT)	INNER BANK	TWO OUTER BANKS
black-backed gull	3 REI	22 REI	5 REI 5 REW
caspian tern			
N.Z. dotterel			
pied shag			
pied stilt			
red-billed gull	5 REI	1 REI	
South Island pied oystercatcher			
variable oystercatcher			3 FI
white-faced heron			

Inner Bank mostly covered.
Outer Banks also mostly covered.

Appendix 6.3

Taurikura Bay Field Data – 18.3.15

TAURIKURA BAY COASTAL BIRD COUNT RESULTS 2015

DATE : 18.3.15 **TIME (hrs) : 0730** **TIDAL STATE : c.HW + 1 hr**

TIDE TIME ; HEIGHT : HW 0614; 2.6 m **AIR TEMP (°C) : ——**

BARO. PRESSURE (hPa) : : —— **WIND (knots) : ——**

WEATHER : refer Urquharts Bay Sheet @ 0730.

australasian gannet	
black-backed gull	
caspian tern	
little shag	
pied shag	
red-billed gull	**13 REI**
spur-winged plover	
variable oystercatcher	**2 REI**
white-faced heron	**1 ROP**

TAURIKURA BAY COASTAL BIRD COUNT RESULTS 2015

DATE : 18.3.15 **TIME (hrs) : 0830** **TIDAL STATE : c.HW + 2 hrs**

TIDE TIME ; HEIGHT : HW 0614; 2.6 m **AIR TEMP (^{o}C) : 18.2**

BARO. PRESSURE (hPa) : 1006 **WIND (knots) : NW to 3 kts**

WEATHER : fine, dry, scattered cloud.

australasian gannet	
black-backed gull	
caspian tern	
little shag	**2 ROP**
pied shag	
red-billed gull	**2 FI; 14 REI**
spur-winged plover	
variable oystercatcher	
white-faced heron	

TAURIKURA BAY COASTAL BIRD COUNT RESULTS 2015

DATE : 18.3.15 **TIME (hrs) : 0930** **TIDAL STATE : c.HW + 3 hrs**

TIDE TIME ; HEIGHT : HW 0614; 2.6 m **AIR TEMP (°C) : ——**

BARO. PRESSURE (hPa) : —— **WIND (knots) : ——**

WEATHER : refer Urquharts Bay Sheet @ 0930.

australasian gannet	
black-backed gull	**1 ROP**
caspian tern	
little shag	**1 ROP**
pied shag	**1 FW**
red-billed gull	**8 REI; 3 FI**
spur-winged plover	**9 REI**
variable oystercatcher	**2 FI**
white-faced heron	

TAURIKURA BAY COASTAL BIRD COUNT RESULTS 2015

DATE : 18.3.15 **TIME (hrs) : 1030** **TIDAL STATE : c.HW + 4 hrs**

TIDE TIME ; HEIGHT : HW 0614; 2.6 m **AIR TEMP (^{o}C) : 21.9**

BARO. PRESSURE (hPa) : 1007 **WIND (knots) : W to 4 kts**

WEATHER : fine, sunny with cloud.

australasian gannet	**1 FW**
black-backed gull	**1 REI**
caspian tern	
little shag	
pied shag	
red-billed gull	**2 FI; 12 REI**
spur-winged plover	
variable oystercatcher	**3 FI**
white-faced heron	

TAURIKURA BAY COASTAL BIRD COUNT RESULTS 2015

DATE : 18.3.15 **TIME (hrs) : 1130** **TIDAL STATE : c.HW + 5 hrs**

TIDE TIME ; HEIGHT : HW 0614; 2.6 m **AIR TEMP (°C) : ——**

BARO. PRESSURE (hPa) : —— **WIND (knots) : ——**

WEATHER : refer Urquharts Bay Sheet @ 1130.

australasian gannet	
black-backed gull	1 REI
caspian tern	1 REI
little shag	1 FW
pied shag	1 REI
red-billed gull	18 REI; 3 FI
spur-winged plover	
variable oystercatcher	2 FI
white-faced heron	1 FI

TAURIKURA BAY COASTAL BIRD COUNT RESULTS 2015

DATE : 18.3.15 **TIME (hrs) : 1230** **TIDAL STATE : c.LW**

TIDE TIME ; HEIGHT : LW 1223; 0.6 m **AIR TEMP (^{o}C) : 21.1**

BARO. PRESSURE (hPa) : 1007 **WIND (knots) : SW to 7 kts**

WEATHER : fine, sunny with cloud.

australasian gannet	1 FW
black-backed gull	1 REI
caspian tern	1 REI
little shag	
pied shag	
red-billed gull	12 REI; 4 FI
spur-winged plover	
variable oystercatcher	2 FI
white-faced heron	1 FI

TAURIKURA BAY COASTAL BIRD COUNT RESULTS 2015

DATE : 18.3.15 **TIME (hrs) : 1330** **TIDAL STATE : c LW + 1 hr**

TIDE TIME ; HEIGHT : LW 1223; 0.6 m **AIR TEMP (°C) : ——**

BARO. PRESSURE (hPa) : —— **WIND (knots) : ——**

WEATHER : refer Urquharts Bay Sheet @ 1330.

australasian gannet	**1 FW**
black-backed gull	**1 REI**
caspian tern	**2 REI**
little shag	**2 ROP ***
pied shag	
red-billed gull	**20 REI**
spur-winged plover	
variable oystercatcher	**2 FI**
white-faced heron	

*pohutukawa western end.

TAURIKURA BAY COASTAL BIRD COUNT RESULTS 2015

DATE : 18.3.15 **TIME (hrs) : 1430** **TIDAL STATE : c.LW + 2 hrs**

TIDE TIME ; HEIGHT : LW 1223; 0.6 m **AIR TEMP (^{o}C) : 21.8**

BARO. PRESSURE (hPa) : 1007 **WIND (knots) : SW to 6 kts**

WEATHER : cloud increasing; 90% cover.

australasian gannet	1 FW
black-backed gull	
caspian tern	
little shag	2 ROP; 1 FW
pied shag	
red-billed gull	24 REI
spur-winged plover	
variable oystercatcher	2 FI
white-faced heron	

TAURIKURA BAY COASTAL BIRD COUNT RESULTS 2015

DATE : 18.3.15 **TIME (hrs) : 1530** **TIDAL STATE : c LW +3 hrs**

TIDE TIME ; HEIGHT : LW 1223; 0.6 m **AIR TEMP (°C) : ——**

BARO. PRESSURE (hPa) : —— **WIND (knots) : ——**

WEATHER : refer Urquharts Bay Sheet @ 1530.

australasian gannet	1 FW
black-backed gull	3 REI
caspian tern	
little shag	2 ROP
pied shag	
red-billed gull	16 REI
spur-winged plover	
variable oystercatcher	2 REI
white-faced heron	

Appendix 6.4

Urquharts Bay Field Data – 18.3.15

URQUHARTS BAY COASTAL BIRD COUNT RESULTS 2015

DATE : 18.3.15 **TIME (hrs) : 0730** **TIDAL STATE : c.HW + 1 hr**

TIDE TIME ; HEIGHT : HW 0614; 2.6 m **AIR TEMP (^{o}C) : 18.2**

BARO. PRESSURE (hPa) : 1005 **WIND (knots) : NW to 2 kts**

WEATHER : fine, dry, scattered cloud.

australasian gannet	
black-backed gull	1 ROP
caspian tern	
little shag	
pied shag	
red-billed gull	27 REI
S.I. pied oystercatcher	
spur-winged plover	
variable oystercatcher	7 REI
white-faced heron	1 ROP; 1 REI
white-fronted tern	

URQUHARTS BAY COASTAL BIRD COUNT RESULTS 2015

DATE : 18.3.15 **TIME (hrs) : 0730** **TIDAL STATE : c.HW + 1 hr**

TIDE TIME ; HEIGHT : HW 0614; 2.6 m **AIR TEMP (^{o}C) : 18.2**

BARO. PRESSURE (hPa) : 1005 **WIND (knots) : NW to 2 kts**

WEATHER : fine, dry, scattered cloud.

australasian gannet	
black-backed gull	**1 ROP**
caspian tern	
little shag	
pied shag	
red-billed gull	**27 REI**
S.I. pied oystercatcher	
spur-winged plover	
variable oystercatcher	**7 REI**
white-faced heron	**1 ROP; 1 REI**
white-fronted tern	

URQUHARTS BAY COASTAL BIRD COUNT RESULTS 2015

DATE : 18.3.15 **TIME (hrs) : 0830** **TIDAL STATE : c.HW + 2 hrs**

TIDE TIME ; HEIGHT : HW 0614; 2.6 m **AIR TEMP (°C) : ——**

BARO. PRESSURE (hPa) : —— **WIND (knots) : ——**

WEATHER : refer Taurikura Bay Sheet @ 0830

australasian gannet	**1 FW**
black-backed gull	**9 REI**
caspian tern	
little shag	
pied shag	
red-billed gull	**25 REI**
S.I. pied oystercatcher	
spur-winged plover	
variable oystercatcher	**13 REI**
white-faced heron	
white-fronted tern	

URQUHARTS BAY COASTAL BIRD COUNT RESULTS 2015

DATE : 18.3.15 **TIME (hrs) : 0930** **TIDAL STATE : c.HW + 3 hrs**

TIDE TIME ; HEIGHT : HW 0614; 2.6 m **AIR TEMP (^{o}C) : 18.7**

BARO. PRESSURE (hPa) : 1006 **WIND (knots) : W to 2 kts**

WEATHER : fine, dry, scattered cloud.

australasian gannet	1 FW
black-backed gull	6 REI
caspian tern	1 REI
little shag	3 ROP
pied shag	
red-billed gull	25 REI; 3 FI
S.I. pied oystercatcher	4 FI
spur-winged plover	
variable oystercatcher	7 FI; 9 REI
white-faced heron	
white-fronted tern	

URQUHARTS BAY COASTAL BIRD COUNT RESULTS 2015

DATE : 18.3.15 **TIME (hrs) : 1030** **TIDAL STATE : c.HW + 4 hrs**

TIDE TIME ; HEIGHT : HW 0614; 2.6 m **AIR TEMP (°C) : ——**

BARO. PRESSURE (hPa) : : —— **WIND (knots) : ——**

WEATHER : refer Taurikura Bay Sheet @ 1030.

australasian gannet	**2 FW**
black-backed gull	**20 REI; 1 REW; 1 ROP**
caspian tern	**2 REI**
little shag	**5 ROP**
pied shag	
red-billed gull	**25 REI**
S.I. pied oystercatcher	**1 FI**
spur-winged plover	
variable oystercatcher	**18 FI; 8 REI**
white-faced heron	**2 FI**
white-fronted tern	

URQUHARTS BAY COASTAL BIRD COUNT RESULTS 2015

DATE : 18.3.15 **TIME (hrs) : 1130** **TIDAL STATE : c.HW + 5 hrs**

TIDE TIME ; HEIGHT : HW 0614; 2.6 m **AIR TEMP (^{o}C) : 21.1**

BARO. PRESSURE (hPa) : 1007 **WIND (knots) : SW to 5 kts**

WEATHER : fine, sunny with cloud.

australasian gannet	
black-backed gull	19 REI; 2 ROP
caspian tern	1 REI
little shag	
pied shag	
red-billed gull	40 REI
S.I. pied oystercatcher	
spur-winged plover	2 REI
variable oystercatcher	23 FI; 4 REI
white-faced heron	2 FI
white-fronted tern	2 REI

URQUHARTS BAY COASTAL BIRD COUNT RESULTS 2015

DATE : 18.3.15 **TIME (hrs) : 1230** **TIDAL STATE : c.LW**

TIDE TIME ; HEIGHT : LW 1223; 0.6 m **AIR TEMP (°C) : ——**

BARO. PRESSURE (hPa) : : —— **WIND (knots) : ——**

WEATHER : refer Taurikura Bay Sheet @ 1230.

australasian gannet	**1 FW**
black-backed gull	**20 REI**
caspian tern	**1 FW**
little shag	**1 FW; 1 ROP**
pied shag	
red-billed gull	**2 FI; 49 REI**
S.I. pied oystercatcher	**5 FI**
spur-winged plover	
variable oystercatcher	**15 FI**
white-faced heron	**1 FI**
white-fronted tern	**2 REI**

URQUHARTS BAY COASTAL BIRD COUNT RESULTS 2015

DATE : 18.3.15 **TIME (hrs) : 1330** **TIDAL STATE : c.LW +1 hr**

TIDE TIME ; HEIGHT : LW 1223; 0.6 m **AIR TEMP (^{o}C) : 22.4**

BARO. PRESSURE (hPa) : 1007 **WIND (knots) : SW to 6 kts**

WEATHER : fine, sunny with cloud.

australasian gannet	
black-backed gull	**18 REI; 4 REW; 1 FI**
caspian tern	**1 FW**
little shag	**4 FW; 1 ROP ***
pied shag	
red-billed gull	**42 REI**
S.I. pied oystercatcher	**7 FI**
spur-winged plover	
variable oystercatcher	**19 FI; 2 REI**
white-faced heron	**2 FI**
white-fronted tern	**2 REI**

***poutukawa southern end**

URQUHARTS BAY COASTAL BIRD COUNT RESULTS 2015

DATE : 18.3.15 **TIME (hrs) : 1430** **TIDAL STATE : c.LW + 2 hrs**

TIDE TIME ; HEIGHT : LW 1223; 0.6 m **AIR TEMP (°C) : ——**

BARO. PRESSURE (hPa) : : —— **WIND (knots) : ——**

WEATHER : refer Taurikura Bay Sheet @ 1430.

australasian gannet	
black-backed gull	**25 REI; 1 FI**
caspian tern	**1 REI**
little shag	**1 FW; 1 ROP**
pied shag	**1 FW**
red-billed gull	**39 REI**
S.I. pied oystercatcher	**3 FI**
spur-winged plover	
variable oystercatcher	**5 FI; 12 REI**
white-faced heron	**1 FI**
white-fronted tern	

URQUHARTS BAY COASTAL BIRD COUNT RESULTS 2015

DATE : 18.3.15 **TIME (hrs) : 1530** **TIDAL STATE : c.LW + 3 hrs**

TIDE TIME ; HEIGHT : LW 1223; 0.6 m **AIR TEMP (^{o}C) : 21.3**

BARO. PRESSURE (hPa) : 1007 **WIND (knots) : SW to 6 kts**

WEATHER : 90% cloud cover, dry.

australasian gannet	
black-backed gull	**1 FI; 16 REI**
caspian tern	**1 REI**
little shag	
pied shag	
red-billed gull	**1 FI; 39 REI**
S.I. pied oystercatcher	
spur-winged plover	
variable oystercatcher	**6 FI; 14 REI**
white-faced heron	**1 FI**
white-fronted tern	

7 PLATES

Plate 1. **Bream Bay Beach at end of Mair Road; view towards southwest near high tide.**

Plate 2. **Bream Bay Beach; view towards northeast near high tide.**

Plate 3. **Bream Bay Beach sea condition during survey.**

Plate 4. **Bream Bay Beach; view towards southwest at low tide (0.2m).**

Plate 5. **Bream Bay Beach; view towards northeast at low tide (0.2m).**

Plate 6. **Marsden Point "beach" sector following high tide.**

Plate 7. **Black-backed gulls and variable oystercatchers on Marsden Point at high tide – February 2015.**

Plate 8. **Black-backed gulls on Marsden Point at high tide – March 2015.**

Plate 9. **Mair Bank; 1000 hours; high water (HW) + 3 hours.**

Plate 10. **Mair Bank; 1100 hours; HW + 4 hours.**

Plate 11. **Mair Bank; 1200 hours; HW + 5 hours.**

Plate 12. **Mair Bank; 1300 hours; low water.**

Plate 13. **Taurikura Bay – southern end at low tide.**

Plate 14. **Taurikura Bay towards the northern end.**

Plate 15. **Taurikura Bay – northern end at low tide.**

Plate 16. **Urquharts Bay – northern end at low tide (south of the wharf).**

Plate 17. Urquharts Bay – southern end at low tide.