

Port Botany Post Construction Environmental Monitoring

Shorebird Off-Peak
Season Summary
Report

September 2018
EL1112046



*Double-banded Plover (key species) in breeding plumage
prior to migration, Penrhyn Estuary
Photo by Chelsea Hankin
20/08/2014*

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Table of Contents

1	Introduction	1
1.1	Background	1
1.2	Purpose of this report	1
2	Monitoring Methodology	2
2.1	Sampling Design	2
2.2	Field Procedures	6
2.3	Indicators Monitored	7
2.4	Quality Control Procedures	7
3	Monitoring Works	8
4	Preliminary Findings	9
5	References	13

Tables

Table 1	Habitats and key species monitored in Penrhyn Estuary and reference sites	2
Table 2	Timing, location and frequency of shorebird monitoring	8
Table 3	Species observed in Penrhyn Estuary 1 April – 31 August 2018	10

Figures

Figure 1	Penrhyn Estuary Shorebird Feeding and Roosting Sites	3
Figure 2	Shorebird Reference Sites: Southern Botany Bay and Boat Harbour Transects	4
Figure 3	Shorebird Reference Sites: Parramatta River Estuary Transects	5
Figure 4	Peak Count of Double-banded Plover at a) Low Tide and b) High Tide in the 2018 off-peak season	11
Figure 5	Peak Abundance of the Double-banded Plover in Penrhyn Estuary during a) Low Tide and b) High Tide in Construction and Post-construction phases	12

Appendices

Appendix A	Shorebird Surveys: Penrhyn Estuary and Reference Site Monitoring
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1 Introduction

1.1 Background

As part of the Port Botany Expansion Project, Sydney Ports (now Port Authority of NSW) rehabilitated Penrhyn Estuary, located adjacent to the port expansion to provide more extensive habitat for migratory shorebirds. Penrhyn Estuary (the Estuary) is a small waterway located to the north of Brotherson Dock, which was artificially created during the reclamation of the Botany foreshore between 1975 and 1978. Since its creation, it has been utilised by a diverse group of migratory birds and is now the only significant shorebird habitat remaining on the northern side of Botany Bay (Avifauna Research & Services 2003).

The purpose of the rehabilitation works was to enhance the existing intertidal habitat and to expand the estuary to an area of approximately 30 ha as long-term habitat for migratory shorebirds. Key enhancement activities included the removal of mangroves and other tall vegetation as well as numerous introduced weeds and the enhancement of existing saltmarsh as well as the creation of a large area of new saltmarsh habitat. An extensive area of foredune was levelled to substantially increase the area of intertidal feeding and roosting habitat for key species of migratory shorebirds that currently use the estuary, and to potentially attract a greater number of shorebirds upon completion. The design, methodology and ongoing maintenance for the Estuary are outlined within the Penrhyn Estuary Habitat Enhancement Plan (PEHEP) (Sydney Ports Corporation 2007).

The key objectives of the PEHEP were to expand the intertidal feeding habitat, provide secure roosting habitat in the form of three 'high tide' islands and restore saltmarsh habitat for shorebird roosting and feeding. Penrhyn Estuary is considered a significant feeding and roosting site in Botany Bay for seven 'key' species (NSW Wader Study Group Data). Six of these species were selected to measure the success of the PEHEP project throughout the habitat pre-construction, construction and post-construction phases. These were: Bar-tailed Godwit, Red-necked Stint, Double-banded Plover, Curlew Sandpiper, Red Knot and Pacific Golden Plover. The Sharp-tailed Sandpiper, however, was considered unsuitable to include for monitoring in the PEHEP because of irregularity in its numbers at coastal sites due to the variability of flooding of inland wetlands. The abundance of the six other key species, compared with counts at reference sites, is considered to be an indicator of success of the PEHEP. No decline in numbers of any of the key species compared with baseline data would be an indication that the habitat enhancement has had no negative impacts. Any increase in the numbers of each of key species during monitoring would potentially be evidence of habitat enhancement.

1.2 Purpose of this report

This report outlines field procedures, provides details of the sites monitored and initial observations of raw data for the off-peak season shorebird monitoring done between 1 April and 31 August 2018. Apart from the Double-banded Plover, which is a trans-Tasman migrant that spends its non-breeding season in Australia between February-August, the other key species are northern hemisphere migrants and generally only return to their non-breeding grounds in the southern hemisphere during the 'peak' season (September to March). Hence, the best indication of the success of the PEHEP works in the post-construction phase is interpreted from analysis after the peak season shorebird monitoring, which is provided in the annual reporting of those data.

2 Monitoring Methodology

2.1 Sampling Design

Fortnightly surveys of shorebird abundance and diversity were carried out during low and high tides at the study site, Penrhyn Estuary, and at selected reference sites from 1 April to 31 August 2018. Where possible, local reference sites were chosen so that all sites could be surveyed on the same day by the same team of shorebird experts. However, as sites around Botany Bay did not support sufficient numbers of some species for analysis, some regional reference sites were selected outside of the Bay (**Table 1** and **Figures 1-3**).

Table 1 Habitats and key species monitored in Penrhyn Estuary and reference sites

Area	Sites	Habitats	Key species
Penrhyn Estuary	Transects 1 & 2	Tidal estuarine mudflats Tidal sand flats Sand spits Sandy beaches Stony substrate Sandy islands	Bar-tailed Godwit Red-necked Stint Pacific Golden Plover Red Knot Curlew Sandpiper Double-banded Plover
Southern Botany Bay	Quibray Bay	Tidal sand flats Sandy beaches Oyster lease structures	Bar-tailed Godwit
	Riverside Drive	Tidal estuarine mudflats Tidal sand flats Sand spit Sandy beaches	
	Woodlands Road	Tidal estuary mudflats Tidal sand flats Sandy beaches	
Boat Harbour (External Reference Area)		Tidal rock platform Tidal sand flats Sandy beaches	Red-necked Stint Double-banded Plover Pacific Golden Plover
Parramatta Estuary ¹	Hen and Chicken Bay	Tidal estuarine mudflats Tidal sand flats Sandy beaches Sand/rock spits Concrete jetty	Curlew Sandpiper
	Mason Park & Waterbird Refuge	Saltmarsh and lagoons	
Hunter River Estuary ¹ (External Reference Area)		Tidal estuarine mudflats Tidal sand flats Sandy beaches Rocky shores	Pacific Golden Plover

¹Reference site only monitored during peak season (September – March)

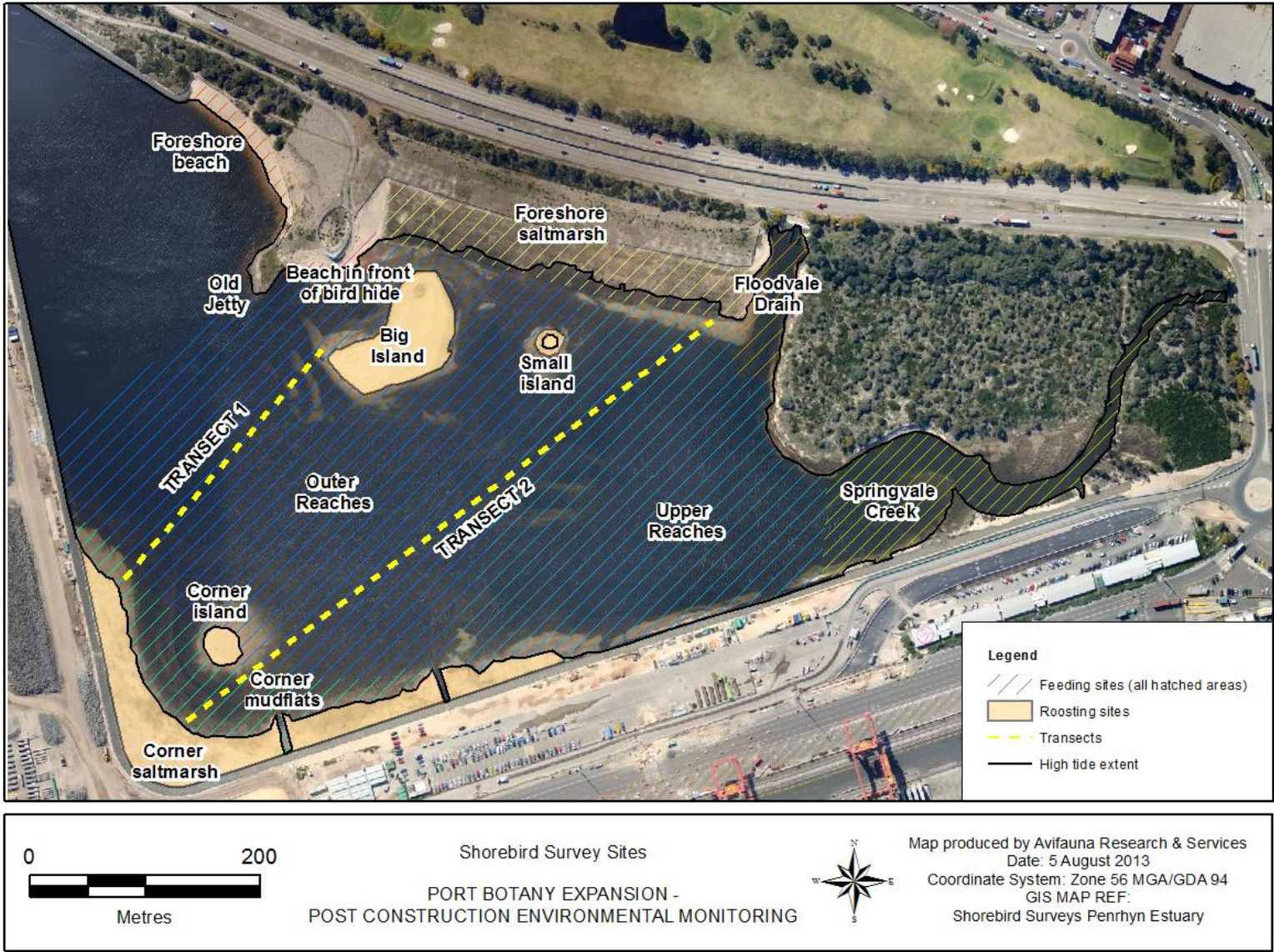


Figure 1 Penrhyn Estuary Shorebird Feeding and Roosting Sites

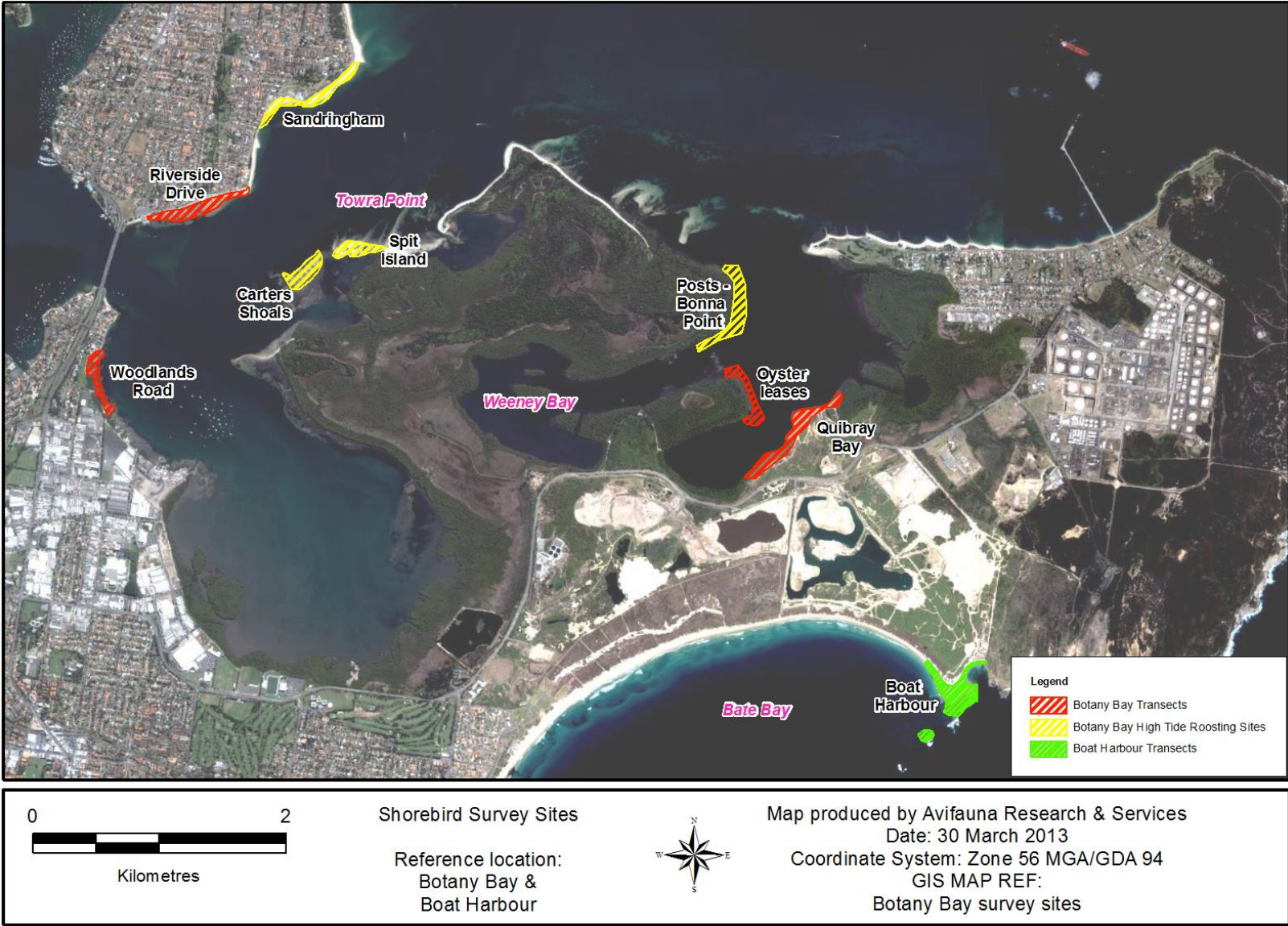


Figure 2 Shorebird Reference Sites: Southern Botany Bay and Boat Harbour Transects

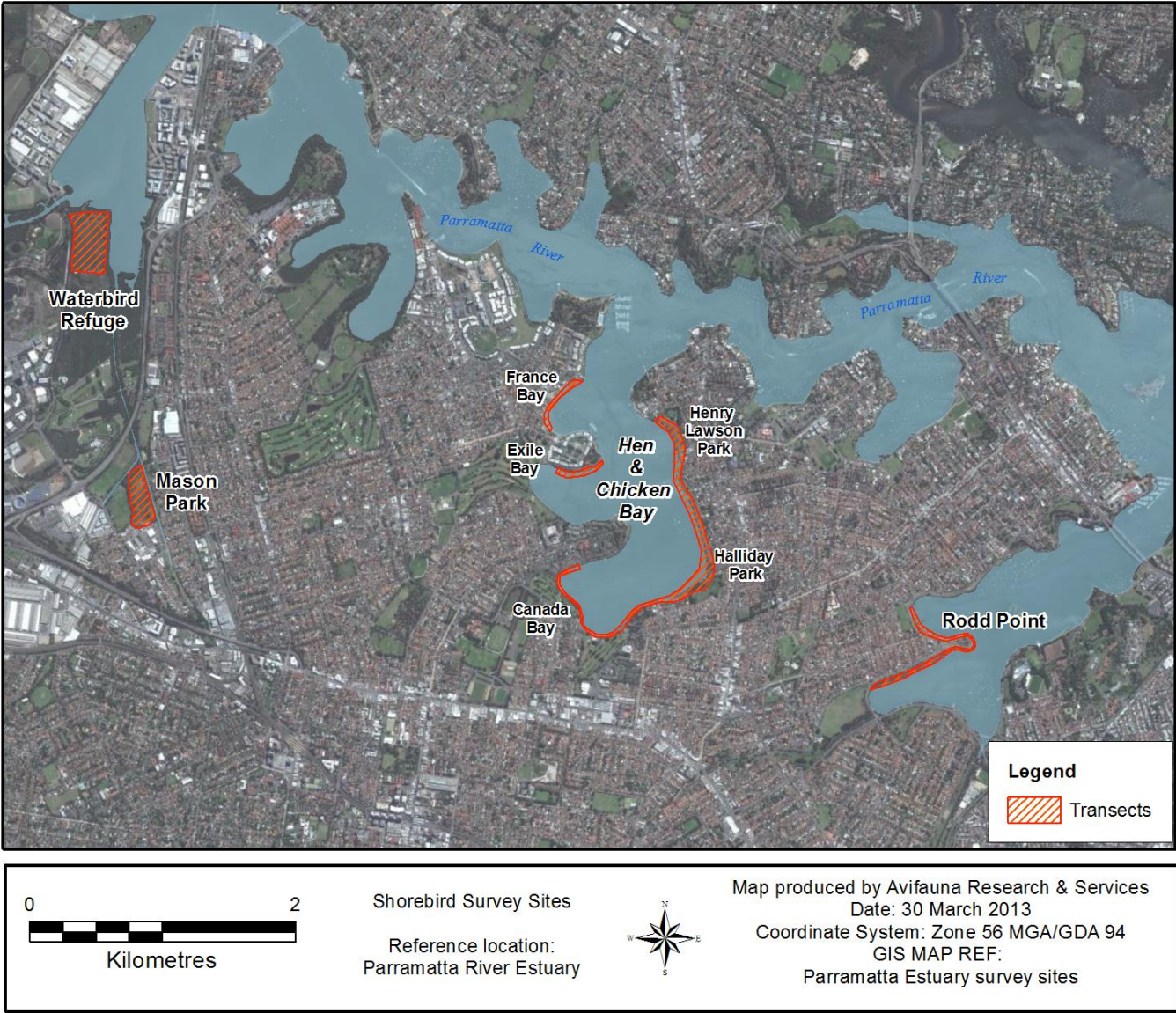


Figure 3 Shorebird Reference Sites: Parramatta River Estuary Transects

2.2 Field Procedures

Penrhyn Estuary

Shorebirds were observed from two transects established across the Estuary. Transects were positioned so that observers had a clear view of shorebird feeding areas (**Figure 1**) and fixed so that data were collected in a consistent format. For two hours at low and high tide, shorebirds were observed with the aid of high-resolution binoculars from transects and their behaviour, habitat usage, abundance and species type were recorded. All shorebirds observed were counted, and in each survey the maximum count of each species was recorded. At low tide, surveys were done either by one or two observers on foot, with vehicular access via Foreshore Road. At high tide, two observers conducted the surveys by boat, with transects varying depending on the height of the tide. The exception was during neap tides or when the weather prevented safe boating, and in these instances high tide counts were instead carried out on foot.

Southern Botany Bay

Three reference sites in Southern Botany Bay were monitored by boat at high tide and on foot at low tide to measure the abundance of shorebirds against those counts obtained from Penrhyn Estuary, while additional high tide roost sites were also monitored to estimate the broader population of Bar-tailed Godwits in Botany Bay (**Figure 2**).

Riverside Drive provides approximately 6 ha of tidal flats, with roosting areas confined to a beach and small sandspit at the outlet of a small creek at Scott Park. Previously, Bar-tailed Godwits regularly used the site at high tide. However, numbers have declined and only observed at this site on an irregular basis. This is most likely due to wind and water erosion of the sandspit reducing suitable roosting habitat and exposure to a higher frequency of disturbance by beach users and dogs.

Woodlands Road Reserve provides approximately 5 ha of mudflats, providing feeding habitat for small numbers of Bar-tailed Godwit. Small areas of exposed sandy beach provide limited roosting space on neap tides but are not available when covered by spring high tides. When these beaches are not available shorebirds roost elsewhere in the Bay. At times, during spring high tides shorebirds were observed roosting on a narrow strip of sand in front of residential dwellings or even on revetment walls, on the roofs of boat houses and other structures.

Quibray Bay supports a steady population of Bar-tailed Godwits and small number of Whimbrel and Eastern Curlew which feed on tidal flats along the shorelines of the bay. These three species roost on exposed beaches during neap tides but are then confined to small beaches and saltmarsh habitat during spring tides. However in recent years the hind beach and saltmarsh habitat have been greatly reduced as a result of weed invasion by Spiny Rush *Juncus acutus* and Bitou Bush *Chrysanthemoides monilifera* causing the birds to rely solely on nearby oyster lease posts when the beach areas are inundated.

Given existing information show that shorebirds move to other locations in Botany Bay in adverse weather (e.g. birds will avoid the exposed oyster leases at times), additional roosting sites at Sandringham, Spit Island and Carters Shoals were also monitored (**Figure 2**).

Boat Harbour

Boat Harbour is a medium-sized sandstone reef (approximately 3 ha), located on the northeast of Bate Bay (**Figure 2**). The reference site provides shelter for migratory shorebirds such as the Red-necked Stint, Double-banded Plover, Pacific Golden Plover and Ruddy Turnstone, which use the area for feeding at low tide and as a roost site at high tide.

Parramatta Estuary

Sites around Parramatta River Estuary were used as reference areas for the Curlew Sandpiper (**Figure 3**), although the area also provides habitat for large numbers of Bar-tailed Godwit. Hen and Chicken Bay provides feeding and roosting sites at several small beaches, rocky outcrops and jetties. Alternative habitat for Curlew Sandpiper and other shorebirds was available in tidal saltmarsh wetlands at Mason Park and the Waterbird Refuge at Homebush, although the former site has been gradually invaded by mangroves rendering the site unsuitable for migratory shorebirds.

Further details of field procedures can be found in the Monitoring Services Management Plan (Cardno 2013).

2.3 Indicators Monitored

Abundance

Shorebird abundance was recorded as the maximum count of birds (peak count) on any one occasion during a survey period (e.g. between off peak period 1 April to 31 August 2018). Counts were recorded separately for low and high tide surveys as well as for diurnal and nocturnal surveys (Penrhyn Estuary only).

Diversity

Shorebird diversity was recorded as the number of species present on any one occasion during a survey.

Behaviour

Shorebird behaviour was recorded at the same time as the counts of birds were recorded.

Disturbance and Predation

Prior to the rehabilitation of Penrhyn Estuary, causes of disturbance, or potential predation, to shorebirds included unleashed dogs, amateur fishermen, bait collectors, people walking and exercising dogs on leash. The reconfiguration of Penrhyn Estuary eliminated public access and hence these disturbances. Remaining sources of disturbance include noise from activity at Port Botany or from traffic using Foreshore Road. During diurnal surveys, observations indicating potential disturbance to birds were recorded, along with attempts to identify the source of disturbances.

Health

The health of two species (Bar-tailed Godwit and Pacific Golden Plover), if present, was monitored at Penrhyn Estuary. This involved estimating the body mass of birds visually using high-definition spotting scopes and digital photography. Health was rated on a scale of 1-5 (5 being the healthiest (fattest) condition). On this scale, a score of 1 would be below normal minimum and would be of concern if the bird also showed other signs of illness such as inactivity. Scores of 2 to 3 are the expected level for birds not immediately preparing to migrate, and scores of 4 to 5 are the expected levels for birds immediately prior to their departure for the northern hemisphere.

2.4 Quality Control Procedures

Shorebird identification was verified through photographic records where necessary. High quality digital photography was also used for count verification with large flocks of birds. Photography was also used to confirm the health condition of shorebirds.

Observers were responsible for entering their own field notes to minimise the handling of the data, reducing potential error. The director reviewed all observations and data before submitting into the database to ensure the accuracy of data collected.

3 Monitoring Works

Shorebird surveys were conducted at Penrhyn Estuary and associated reference sites as outlined below.

Table 2 Timing, location and frequency of shorebird monitoring

Where	When	What
Penrhyn Estuary	Fortnightly, 1 April- 31 August	<ul style="list-style-type: none"> > Shorebird abundance, diversity and behaviour > Disturbance and predation > Shorebird health
<i>Reference sites</i>		
Southern Botany Bay	Fortnightly, 1 April- 31 August	> Shorebird abundance, diversity and behaviour
Parramatta Estuary	Fortnightly, 1 April- 31 August	> Shorebird abundance, diversity and behaviour
Boat Harbour	Fortnightly, 1 April- 31 August	> Shorebird abundance, diversity and behaviour

4 Preliminary Findings

Raw data for off-peak season counts for 2018 are given in **Appendix A**. Two of the six key species (Double-banded Plover and Pacific Golden Plover) were observed in Penrhyn Estuary during the off-peak season, April to August 2018 (**Table 3**). The Bar-tailed Godwit, Pacific Golden Plover, Red-necked Stint, Red Knot and Curlew Sandpiper are all northern hemisphere migrants, with only small numbers of Red-necked Stint and Bar-tailed Godwit remaining in their non-breeding grounds. The Double-banded Plover is a trans-Tasman migrant, spending its non-breeding season in Australia between February-August, returning to breed in New Zealand between August-March.

Double-banded Plovers were recorded at low tide at Penrhyn Estuary during the 2018 off-peak period whereas in contrast, they were recorded monthly between April and August at Boat Harbour (reference site) (**Figure 4a and b**). This preference to forage and roost outside of the Penrhyn Estuary area suggests that it remains uncertain whether or not pre-construction abundance levels will return to the site.

Numbers of Double-banded Plover in Penrhyn Estuary declined during the construction phase of the Port Botany Expansion (**Figure 5**). In the first three years of the post-construction phase there was a gradual increase in abundance of Double-banded Plover in Penrhyn Estuary in the low tide surveys, where peak counts approached pre-construction levels (**Figure 5a**). Peak counts at high tide, however, declined so that in 2013 they were about 10% of pre-construction levels (**Figure 5b**). In 2014 at low tide, a slight decline in peak counts was observed but there was an increase in counts at high tide (**Figure 5a and b**). Counts in 2015 were similar to 2014 for high and low tide but around half of the (target) pre-construction levels. Low tide counts in 2016 were less than half of the target and none were observed at high tide. In 2017, low tide and high tide surveys failed to register a single Double-banded Plover (**Figure 5a and b**). This drop in peak abundance over the 'off-peak' season could be a reflection of the overall decrease in shorebird abundance being observed across the wider Botany Bay area, or presence at sites not covered during this study, for example Sydney Airport.

Two Pacific Golden Plovers were observed on high and low tide on 4 April just before migration, showing typical pre-breeding plumage and increased body mass. After this date, Pacific Golden Plover was absent from Penrhyn Estuary during the off-peak season, whilst 25 Pacific Golden Plovers remained at Boat Harbour until 5 April. Red-necked stints were also absent from Penrhyn Estuary, however up to 27 remained at Boat Harbour throughout this period.

These data and other trends will be examined in more detail in the annual report for 2018, which will include data up to the end of the shorebird monitoring program (November 2018).

Table 3 Species observed in Penrhyn Estuary 1 April – 31 August 2018

Species	EPBC Act	BC Act
Australasian Darter		
Australian Pelican		
Australian White Ibis		
Black-winged Stilt		
Caspian Tern		
Cattle Egret		
Chestnut Teal		
Crested Tern		
Eastern Great Egret		
Eastern Osprey	M	V
White-bellied Sea-Eagle	M	
Great Cormorant		
Grey Teal		
Little Black Cormorant		
Little Egret		
Little Pied Cormorant		
Masked Lapwing		
Pacific Black Duck		
Pacific Golden Plover*	M	
Pied Cormorant		
Australian Pied Oystercatcher		E
Red-capped Plover		
Double-banded Plover	M	
Royal Spoonbill		
Crested Tern		
Silver Gull		
Striated Heron		
White-faced Heron		

* Key species for Penrhyn Estuary; BC: Species protected under the Biodiversity Conservation Act 2016 (V = Vulnerable, E = Endangered); EPBC: Species protected under the Environment Protection and Biodiversity Conservation Act 1999 (M = Migratory species, CE = Critically Endangered)

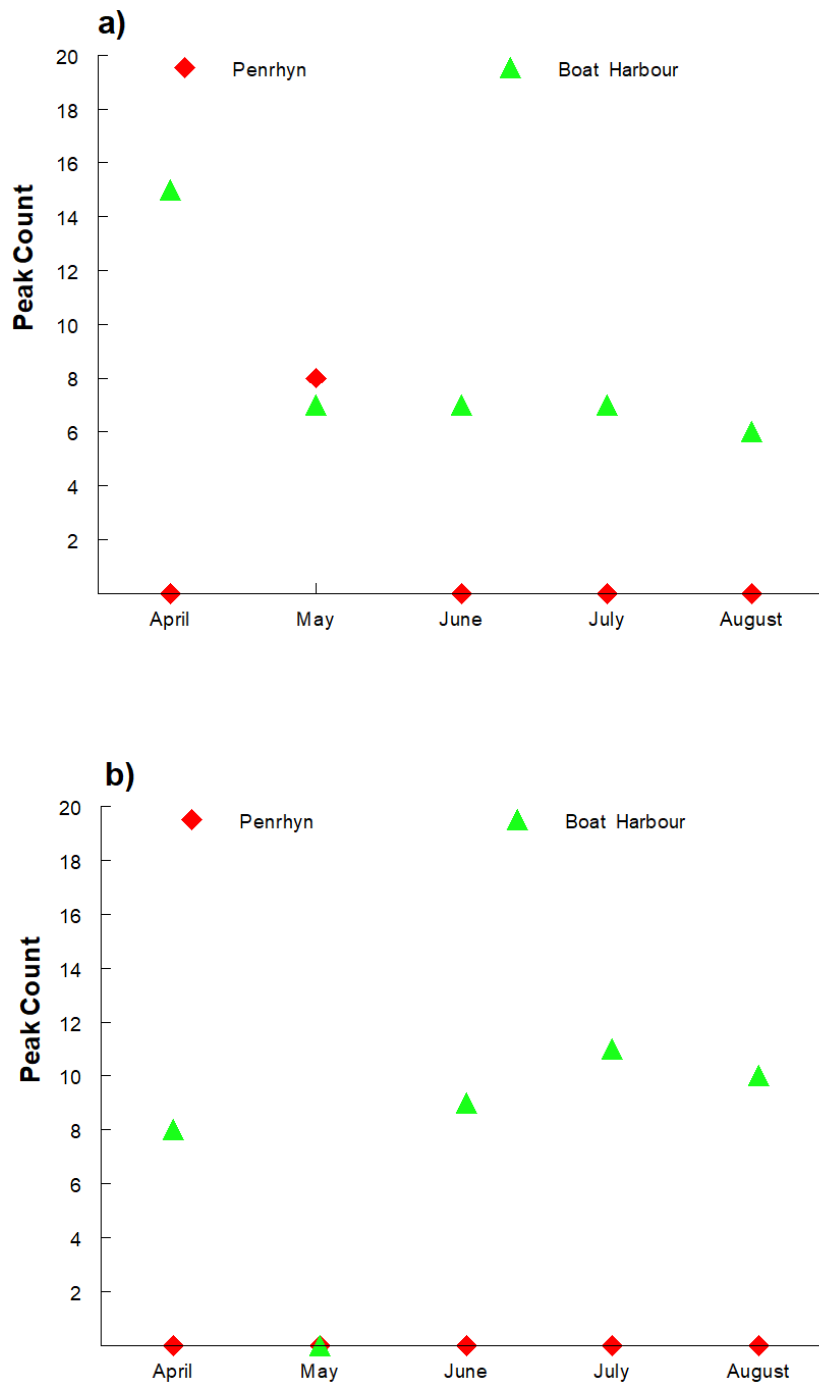


Figure 4 Peak Count of Double-banded Plover at a) Low Tide and b) High Tide in the 2018 off-peak season

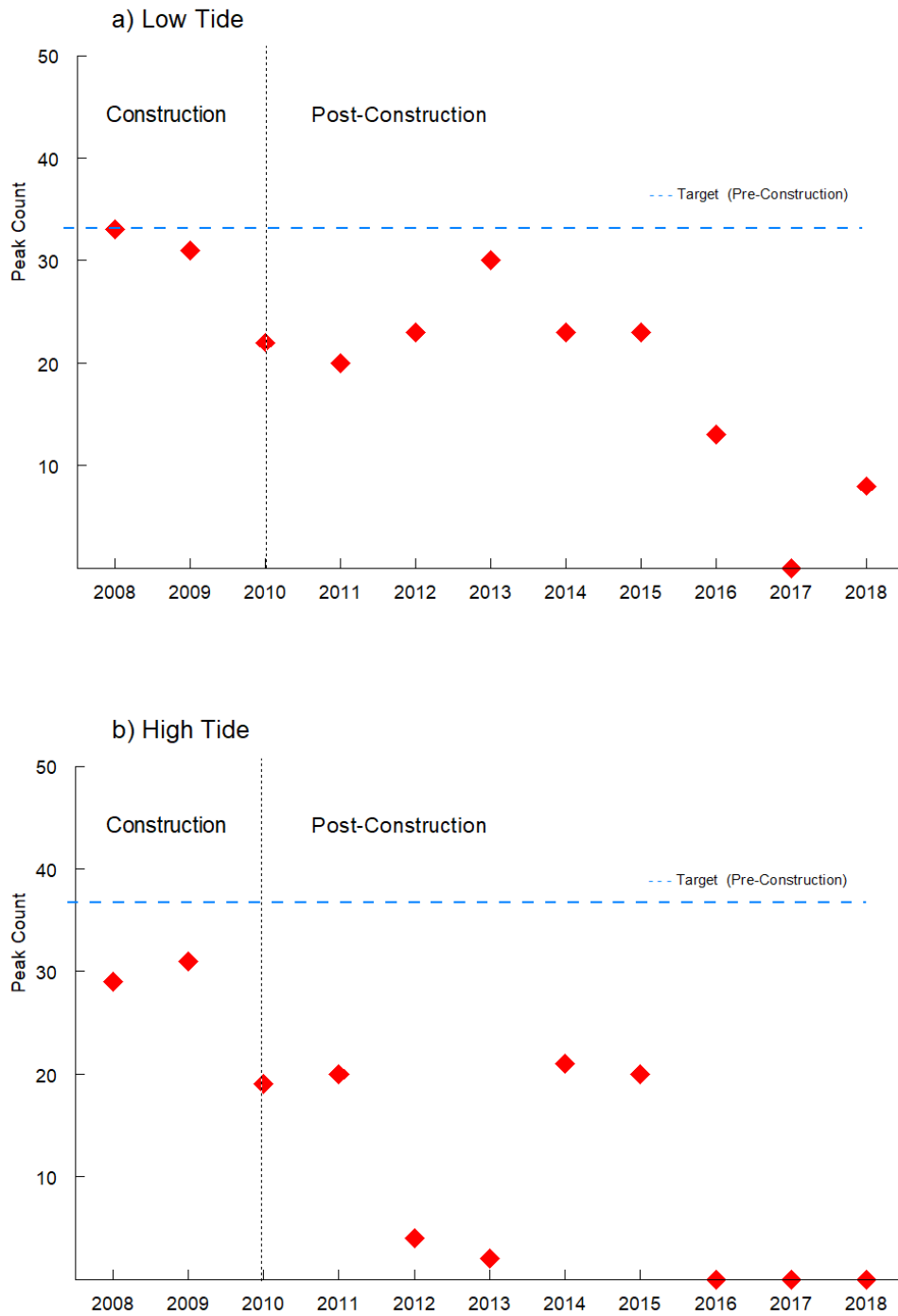


Figure 5 Peak Abundance of the Double-banded Plover in Penrhyn Estuary during a) Low Tide and b) High Tide in Construction and Post-construction phases

5 References

Avifauna Research & Services (2013). *Port Botany Post Construction Environmental Monitoring: Shorebirds Monitoring Off-Peak Summary Report*. Prepared for Sydney Ports Corporation. Period ending August 2013.

Cardno (2013). *Port Botany Expansion Environmental Enhancement Works – Post Construction Environmental Monitoring. Monitoring Services Management Plan*. Prepared for Sydney Ports Corporation. August 2013.

Shorebird Off-Peak Season Summary
Report

APPENDIX A

SHOREBIRD SUVEYS:
PENRHYN ESTUARY AND
REFERENCE SITES



Appendix A: Shorebird Surveys: Penrhyn Estuary and Reference Sites

A-1: Diurnal Shorebird Surveys: Penrhyn Estuary (Key Species)

Subsite	Common Name	Count	Behaviour	Habitat	Date	Tide
Outer Reaches	Double-banded Plover	8	Feeding	Exposed mud/sand	16/05/2018	Low
Outer Flushing Channel	Pacific Golden Plover	2	Roosting	Rocks	04/04/2018	High
Outer Flushing Channel	Pacific Golden Plover	2	Roosting	Rocks	04/04/2018	Low

A-2: Reference Site Monitoring: Botany Bay (Bar-tailed Godwit)

Subsite	Common Name	Count	Behaviour	Habitat	Date	Tide
Posts opposite Bonna Point	Bar-tailed Godwit	13	Roosting	Artificial structure	03/04/2018	High
Oyster leases Quibray	Bar-tailed Godwit	6	Roosting	Artificial structure	03/04/2018	High
Spit Island	Bar-tailed Godwit	135	Roosting	Sandspit	03/04/2018	High
Quibray Bay	Bar-tailed Godwit	22	Feeding	Exposed mud/sand	03/04/2018	Low
Woodlands Rd	Bar-tailed Godwit	6	Feeding	Exposed mud/sand	03/04/2018	Low
Riverside Drive	Bar-tailed Godwit	6	Feeding	Exposed mud/sand	03/04/2018	Low
Spit Island	Bar-tailed Godwit	38	Roosting	Sandspit	20/04/2018	High
Quibray Bay	Bar-tailed Godwit	5	Roosting	Beach	20/04/2018	High
Quibray Bay	Bar-tailed Godwit	8	Feeding	Exposed mud/sand	20/04/2018	Low
Quibray Bay	Bar-tailed Godwit	6	Roosting	Beach	02/05/2018	High
Woodlands Rd	Bar-tailed Godwit	31	Roosting	Beach	02/05/2018	High
Riverside Drive	Bar-tailed Godwit	8	Feeding	Exposed mud/sand	02/05/2018	Low
Quibray Bay	Bar-tailed Godwit	6	Feeding	Exposed mud/sand	02/05/2018	Low
Sandringham	Bar-tailed Godwit	6	Feeding	Beach	19/05/2018	High
Riverside Drive	Bar-tailed Godwit	5	Feeding	Beach	19/05/2018	High
Woodlands Rd	Bar-tailed Godwit	14	Feeding	Beach	19/05/2018	High
Oyster leases Quibray	Bar-tailed Godwit	7	Roosting	Artificial structure	19/05/2018	High
Quibray Bay	Bar-tailed Godwit	7	Feeding	Exposed mud/sand	19/05/2018	Low
Riverside Drive	Bar-tailed Godwit	4	Feeding	Exposed mud/sand	19/05/2018	Low
Quibray Bay	Bar-tailed Godwit	5	Roosting	Beach	30/05/2018	High
Woodlands Rd	Bar-tailed Godwit	5	Feeding	Exposed mud/sand	30/05/2018	Low
Quibray Bay	Bar-tailed Godwit	4	Feeding	Exposed mud/sand	30/05/2018	Low
Sandringham	Bar-tailed Godwit	16	Roosting	Beach	15/06/2018	High
Woodlands Rd	Bar-tailed Godwit	18	Roosting	Beach	15/06/2018	High
Oyster leases Quibray	Bar-tailed Godwit	2	Roosting	Artificial structure	15/06/2018	High
Quibray Bay	Bar-tailed Godwit	5	Feeding	Exposed mud/sand	15/06/2018	Low

Riverside Drive	Bar-tailed Godwit	3	Feeding	Exposed mud/sand	29/06/2018	Low
Woodlands Rd	Bar-tailed Godwit	2	Feeding	Exposed mud/sand	29/06/2018	Low
Quibray Bay	Bar-tailed Godwit	3	Feeding	Exposed mud/sand	29/06/2018	Low
Sandringham	Bar-tailed Godwit	14	Roosting	Beach	14/07/2018	High
Woodlands Rd	Bar-tailed Godwit	14	Roosting	Beach	14/07/2018	High
Riverside Drive	Bar-tailed Godwit	4	Feeding	Exposed mud/sand		
Quibray Bay	Bar-tailed Godwit	4	Feeding	Exposed mud/sand		
Oyster leases Quibray	Bar-tailed Godwit	3	Roosting	Artificial structure		
Sandringham	Bar-tailed Godwit	15	Roosting	Beach		
Riverside Drive	Bar-tailed Godwit	6	Feeding	Exposed mud/sand		
Quibray Bay	Bar-tailed Godwit	4	Feeding	Exposed mud/sand		
Quibray Bay	Bar-tailed Godwit	8	Roosting	Beach		
Quibray Bay	Bar-tailed Godwit	4	Feeding	Exposed mud/sand		

A-3: Reference Site Monitoring: Parramatta River (Curlew Sandpiper)
Not recorded

A-4: Reference Site Monitoring: Boat Harbour (Pacific Golden Plover)

Subsite	Common Name	Count	Behaviour	Habitat	Date	Tide
Boat Harbour	Pacific Golden Plover	25	Roosting	Rocks	05/04/2018	Low

A-5: Reference Site Monitoring: Boat Harbour (Double-banded Plover)

Subsite	Common Name	Count	Behaviour	Habitat	Date	Tide
Boat Harbour	Double-banded Plover	15	Roosting	Rocks	05/04/2018	Low
Boat Harbour	Double-banded Plover	8	Roosting	Rocks	30/04/2018	High
Boat Harbour	Double-banded Plover	7	Roosting	Rocks	30/04/2018	Low
Boat Harbour	Double-banded Plover	7	Feeding	Rocks	17/05/2018	Low
Boat Harbour	Double-banded Plover	6	Feeding	Rocks	31/05/2018	Low
Boat Harbour	Double-banded Plover	3	Feeding	Rocks	14/06/2018	Low
Boat Harbour	Double-banded Plover	9	Roosting	Rocks	29/06/2018	High
Boat Harbour	Double-banded Plover	7	Feeding	Rocks	29/06/2018	Low
Boat Harbour	Double-banded Plover	11	Roosting	Rocks	12/07/2018	High
Boat Harbour	Double-banded Plover	7	Feeding	Rocks	12/07/2018	Low
Boat Harbour	Double-banded Plover	9	Roosting	Rocks	27/07/2018	High

Boat Harbour	Double-banded Plover	6	Feeding	Rocks	27/07/2018	Low
Boat Harbour	Double-banded Plover	10	Roosting	Rocks	13/08/2018	High
Boat Harbour	Double-banded Plover	6	Feeding	Rocks	13/08/2018	Low
Boat Harbour	Double-banded Plover	2	Roosting	Rocks	30/08/2018	High
Boat Harbour	Double-banded Plover	2	Feeding	Rocks	30/08/2018	Low

A-6: Reference Site Monitoring: Boat Harbour (Red-necked Stint)

Subsite	Common Name	Count	Behaviour	Habitat	Date	Tide
Boat Harbour	Red-necked Stint	23	Feeding	Rocks	05/04/2018	High
Boat Harbour	Red-necked Stint	8	Feeding	Rocks	05/04/2018	Low
Boat Harbour	Red-necked Stint	27	Roosting	Rocks	16/04/2018	High
Boat Harbour	Red-necked Stint	16	Feeding	Rocks	16/04/2018	Low
Boat Harbour	Red-necked Stint	7	Roosting	Rocks	30/04/2018	High
Boat Harbour	Red-necked Stint	3	Roosting	Rocks	30/04/2018	Low
Boat Harbour	Red-necked Stint	11	Roosting	Rocks	17/05/2018	High
Boat Harbour	Red-necked Stint	9	Feeding	Rocks	17/05/2018	Low
Boat Harbour	Red-necked Stint	16	Roosting	Rocks	31/05/2018	High
Boat Harbour	Red-necked Stint	11	Feeding	Rocks	31/05/2018	Low
Boat Harbour	Red-necked Stint	20	Roosting	Rocks	14/06/2018	High
Boat Harbour	Red-necked Stint	6	Feeding	Rocks	14/06/2018	Low
Boat Harbour	Red-necked Stint	8	Roosting	Rocks	29/06/2018	High
Boat Harbour	Red-necked Stint	5	Feeding	Rocks	29/06/2018	Low
Boat Harbour	Red-necked Stint	7	Roosting	Rocks	12/07/2018	High
Boat Harbour	Red-necked Stint	6	Feeding	Rocks	12/07/2018	Low
Boat Harbour	Red-necked Stint	11	Roosting	Rocks	27/07/2018	High
Boat Harbour	Red-necked Stint	6	Feeding	Rocks	27/07/2018	Low
Boat Harbour	Red-necked Stint	4	Roosting	Rocks	13/08/2018	High
Boat Harbour	Red-necked Stint	3	Feeding	Rocks	13/08/2018	Low
Boat Harbour	Red-necked Stint	4	Roosting	Rocks	30/08/2018	High
Boat Harbour	Red-necked Stint	31	Feeding	Rocks	30/08/2018	Low