Learmonth Pipeline Fabrication Facility

Migratory Shorebird Survey

Prepared for: MBS Environmental

Prepared by: Western Wildlife
8 Ridgeway Place
Mahogany Creek WA 6072
Ph 0427 510 934

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1. Introduction

Subsea7 Australia Contracting Pty Ltd (Subsea 7) proposes to construct and operate an onshore pipeline fabrication facility east of Minilya-Exmouth Road, Learmonth, approximately 35km south of Exmouth (Figure 1). The Learmonth Bundle Site crosses the beach and extends into the subtidal area at Heron Point in the Exmouth Gulf. The coastal habitats of the Exmouth Gulf are known to support migratory shorebirds, most of which are listed as Migratory under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

On behalf of Subsea7, MBS Environmental commissioned Western Wildlife to undertake surveys for migratory shorebirds at the proposed launchway location at Heron Point, and adjacent shoreline where there is potential for temporary disturbance during construction. The scope of the survey requested was for two surveys in the vicinity of Heron Point, one in October to represent southward migration and one in January, to represent the non-breeding season.

1.1 Background

At the Commonwealth level, migratory shorebirds are listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The species listed under the EPBC Act includes those listed under the China-Australia Migratory Bird Agreement (CAMBA), the Japan-Australia Migratory Bird Agreement (JAMBA), the Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA) and the Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention). All migratory species listed under the EPBC Act are considered Matters of National Environmental Significance (MNES). Migratory shorebirds are also protected under the *Western Australian Biodiversity Conservation Act* 2016 (BC Act). Some shorebird species are also listed as Threatened under the EPBC Act and BC Act, or as Priority species by the Department of Biodiversity and Conservation (DBCA).

In this report 'migratory shorebirds' are the 37 species listed in EPBC Act policy statement 3.21 (DoEE 2017). These species are listed under the EPBC Act and regularly visit Australia on their migration. The migratory shorebirds that visit Australia are from the East Asian – Australasian (EAA) flyway. The EAA flyway is one of nine major waterbird flyways around the world, and includes Russia, Alaska, parts of south and east Asia, Australia and New Zealand (DoE 2015b). Hansen *et al*. (2016) provide updated estimates of the flyway population size of the 37 migratory shorebird species.

The birds of the EAA flyway migrate south from the northern hemisphere (southern migration) typically arriving in Australia during September - October, using stopover or staging sites before dispersing to intertidal flats on the mainland, coastal areas, or freshwater wetlands and grasslands. They then spend the non-breeding season (December - February) in these habitats, building up stores of fat before returning to the northern hemisphere to breed (northern migration) in February - April.

The Wildlife Conservation Plan for Migratory Shorebirds (DoE 2015b) provides a framework for migratory shorebird conservation in Australia. This document identifies the key threats to migratory shorebird populations in the EAA flyway, of which the most significant is habitat loss due to coastal developments within Australia, and in staging/stop-over areas outside Australia, particularly the Yellow Sea. Habitat modification can cause areas to become unsuitable for shorebirds. Other threats include invasive species such as feral predators, chronic or acute pollution, changed hydrological regimes, anthropogenic disturbance and climate change.

Scale: 1:30000
Original Size: A4
Aerial Photo: ESRI Satellite
Grid: EPSG:3857

0 0.5 1 km

Subsea 7
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Figure 1

Bay of Rest North Survey Area

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EPBC Act Policy Statement 3.21 (DoEE 2017) provides guidelines for avoiding, assessing and mitigating impacts on EPBC Act listed migratory shorebird species. Significant impacts on migratory shorebirds are highly likely in the event of destruction, isolation or substantial modification of important areas of habitat, and/or the serious disruption of the lifecycle of an ecologically significant proportion of the population of a migratory species (DoEE 2017). Important habitat for a migratory species can include areas that are only used occasionally or periodically, but supports an ecologically significant proportion of the population. In the case of migratory shorebirds, this can include a site that is important during one or more of the breeding or non-breeding season, or as a staging area during northward or southward migration (Bamford *et al*. 2008).

2. Methods

2.1 Licencing and Guidelines

The migratory shorebird survey was carried out under Regulation 17 Licence 08-002970-01 issued by the Department of Biodiversity, Conservation and Attractions (DBCA). The survey was conducted with reference to the following guidelines:

- Environmental Protection Authority (EPA) Technical Guidance - Terrestrial Fauna Surveys (EPA 2016)
- Technical Guide – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment (EPA & DEC 2010)
- EPBC Act Policy Statement 3.2.1 – Industry guidelines for avoiding, assessing and mitigating impacts on EPBC Act listed migratory shorebird species (DoEE 2017)

2.2 Personnel

The migratory shorebird surveys were conducted by Dr Mike Craig, assisted by Julia White of MBS Environmental in October 2018 and Jenny Wilcox of Western Wildlife in January 2019. Mike Craig has over 30 years' experience counting migratory shorebirds and other littoral birds. The report was prepared by Jenny Wilcox of Western Wildlife, with input from Mike Craig.

2.3 Literature Review

To identify the migratory shorebirds that potentially occur in the study area, extracts were obtained from the NatureMap Database (DBCA 2007-) and EPBC Act Protected Matters Search Tool (DoEE 2019). The search area was a circle with a radius of 4km, centred on Heron Point (-22.263 S, 114.133 E). An extract of BirdLife Australia's Shorebirds2020 Database was provided by MBS Environmental, for migratory shorebird counts in the Exmouth Gulf. These data are counts of shorebirds at various sites around the Gulf.

2.4 Bird Surveys

The survey areas for high and low tide were centred on Heron Point, where the proposed development envelope crosses the shoreline, situated on the Bay of Rest North. The coast north and south of this was surveyed, with the length of the survey area determined by the amount of ground that could reasonably be covered within two hours of high or low tide. Each survey area was broken into smaller sections to increase the spatial resolution of the birds observed.

High tide surveys aimed to identify the spatial location of birds roosting at high tide. A congregation of 10 or more birds was considered a roost and its GPS location taken. Fewer than 10 birds were counted as outside roosts and assigned to one of the five high tide sections (Figure 1) based on their location. High tide counts were conducted from:

- 10:00 to 13:50 on 11th October 2018 around a high tide of 2.63m at 12:42
- 11:00 to 15:00 on 24th January 2019 around a high tide of 2.50m at 13:32

Low tide counts aimed to identify which subtidal areas were used by birds for foraging. This involved counting birds in subtidal areas at low tide in each of the seven low tide sections (Figure 1). Low tide counts were conducted from:

- 06:00 to 08:20 on 12th October 2018 around a low tide of 0.16m at 07:03
- 06:45 to 08:50 on 25th January 2019 around a low tide of 0.34m at 07:49

All birds using the habitats were counted when present, including all shorebirds, gulls, terns, egrets and other intertidal species.

2.5 Internationally and Nationally Significant Site Criteria

A 'site' is defined in EPBC Act policy statement 3.21 as the entire (discrete) area of contiguous habitat used by the same group of migratory shorebirds, which may include multiple roosts and feeding areas (DoEE 2017). For the purposes of this report the 'site' is considered to be the entire survey area, however, it is difficult to determine the true extent of the area used by a particular group of shorebirds when working in a continuous strip of coastal habitat.

Internationally significant sites are considered to be those that support:

- at least 1% of the global or flyway population of a migratory shorebird species
- at least 20,000 migratory shorebirds

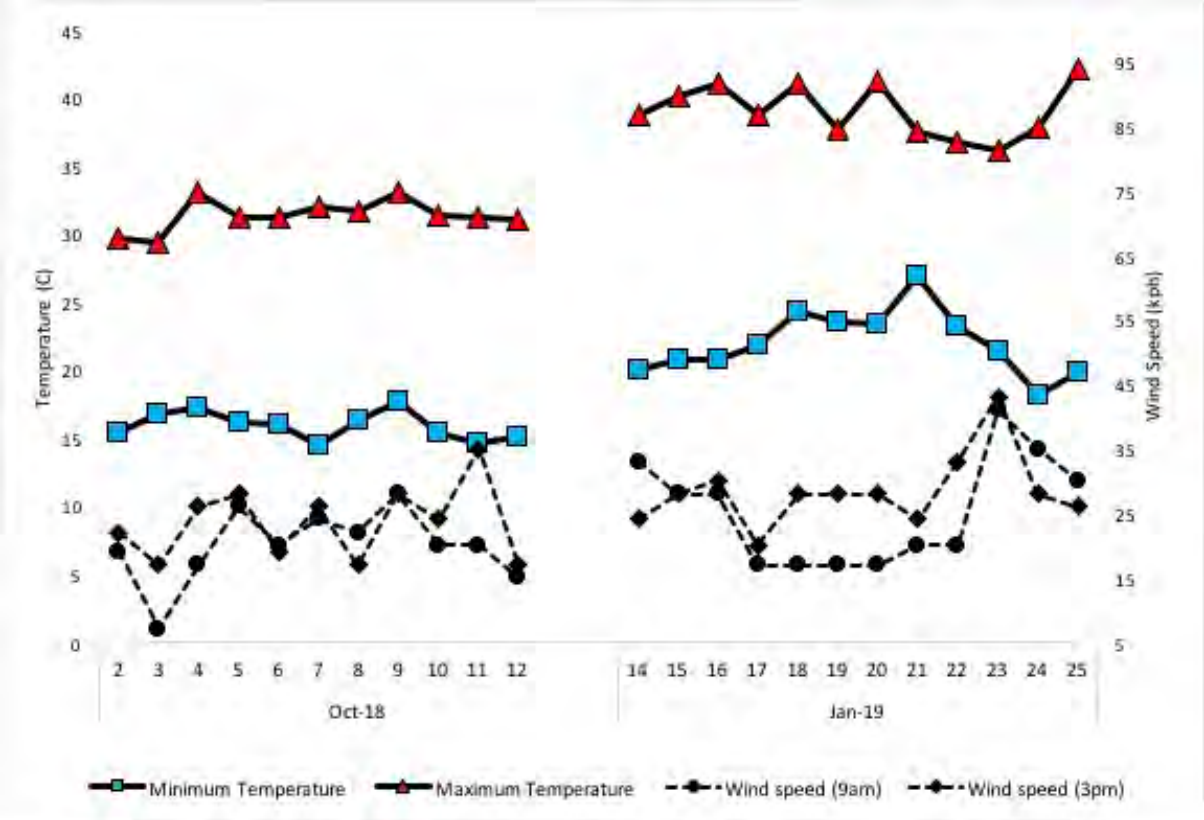
Nationally significant sites are considered to be those that support:

- at least 0.1% of the flyway population of a migratory shorebird species
- at least 2,000 migratory shorebirds
- at least 15 migratory shorebird species.

The 1% and 0.1% flyway population criteria were determined using the flyway population estimates given in Hansen *et al.* (2016).

2.6 Weather

The temperature and wind speed at Learmonth Airport (Bureau of Meteorology Site 005007) are presented in Graph 1, for each survey period and the week prior. No rainfall fell during this period and the weather was generally warm to hot. Mean wind speed at Learmonth Airport in October is 21.0km/h at 9am and 23.6km/h at 3pm (BoM 2019). Mean wind speed at Learmonth Airport in January is 20.5km/h at 9am and 24.6km/h at 3pm (BoM 2019). Wind speed during the surveys was generally higher than average for the afternoon high tide surveys, with 35km/h recorded at 3pm in October, and 28km/h recorded at 3pm in January. Wind speed during the morning low tide surveys was below average in October, with 15km/h recorded at 9am, and higher than average in January, at 30km/h at 9am (BoM 2019).



Graph 1. Temperature and Wind Speed at Learmonth Airport.

2.7 Limitations

The surveys were undertaken at appropriate tide heights for shorebirds, sufficient time was allowed to survey the entire site and the survey was conducted by a zoologist experienced in shorebird identification. The main limitation is that the surveys were simply a snapshot in time and the location of high tide roosts and the extent of foraging habitat exposed is likely to vary depending on the height of the tide. The DoEE (2017) recommends that at least four surveys are undertaken during the months that the majority of shorebirds are present, plus a survey for immature or overwintering birds in the breeding season, and this study comprised two surveys only. However, regional data are available from Birdlife Australia's Shorebirds 2020 database, including contemporary data for the Bay of Rest North, collected in 2017 and 2018. These data include a breeding season survey and six surveys between February and March, within the period of peak shorebird abundance.

3. Results

3.1 Potentially Occurring Migratory Shorebird Species

A total of 24 shorebird species and two additional subspecies potentially occur in the study area, of which 22 are listed as Migratory under the EPBC Act (Table 1). The Red-capped Plover and Red-kneed Dotterel are shorebird species that do not migrate. Several species are listed by the EPBC PMST, as the study area falls within their predicted distribution, but are not represented by nearby records on NatureMap or in the Shorebirds2020 data for the Bay of Rest.

Table 1. Shorebird species that potentially occur in the study area.

Species		Status		Records		
		EPBC Act	BC Act	Nature -Map	EPBC PMST	Shorebirds 2020 (Bay of Rest)
Bar-tailed Godwit	*Limosa lapponica*	Mi	Mi	+	+	+
- (West Alaskan subspecies)	*Limosa lapponica baueri*	Vu, Mi	Vu, Mi		+	
- (Northern Siberian subspecies)	*Limosa lapponica menzbieri*	Cr, Mi	Vu, Mi		+	
Common Greenshank	*Tringa nebularia*	Mi	Mi	+	+	+
Common Sandpiper	*Tringa hypoleucos*	Mi	Mi	+	+	+
Curlew Sandpiper	*Calidris ferruginea*	Cr, Mi	Vu, Mi	+	+	+
Eastern Curlew	*Numenius madagascariensis*	Cr, Mi	Cr, Mi	+	+	+
Great Knot	*Calidris tenuirostris*	Cr, Mi	Vu, Mi	+		+
Greater Sand Plover	*Charadrius leschenaultii*	Mi	Mi	+		+
Grey Plover	*Pluvialis squatarola*	Mi	Mi	+		+
Grey-tailed Tattler	*Tringa brevipes*	Mi	Mi, P4	+		+
Lesser Sand Plover	*Charadrius mongolus*	Mi	Mi	+		+
Marsh Sandpiper	*Tringa stagnatilis*	Mi	Mi	+		+
Oriental Plover	*Charadrius veredus*	Mi	Mi	+	+	+
Oriental Pratincole	*Glareola maldivarum*	Mi	Mi		+	
Pacific Golden Plover	*Pluvialis fulva*	Mi	Mi	+		+
Pectoral Sandpiper	*Calidris melanotos*	Mi	Mi		+	
Red-capped Plover	*Charadrius ruficapillus*			+		
Red-kneed Dotterel	*Erythrogonys cinctus*			+		+
Red Knot	*Calidris canutus*	En, Mi	Mi		+	
Red-necked Stint	*Calidris ruficollis*	Mi	Mi	+		+
Ruddy Turnstone	*Arenaria interpres*	Mi	Mi	+		+
Sanderling	*Calidris alba*	Mi	Mi	+		+
Sharp-tailed Sandpiper	*Calidris acuminata*	Mi	Mi	+	+	+
Terek Sandpiper	*Xenus cinereus*	Mi	Mi	+		+
Whimbrel	*Numenius phaeopus*	Mi	Mi	+		+

3.2 Shorebird Habitat in the Study Area

3.2.1 Roosting Habitat

High tide roost habitats were either sand or rock (Plates 1 & 2). All of the Western and North-eastern sections were sand. The Eastern section was primarily sand with a few rocky points. The South-eastern section was rocky for almost its entire length with small areas of sand intermixed. The Southern section was primarily sand but with regular small rocky parts in the northern three-quarters of the section.

Plate 1. The sandy beach looking from the North-west section into the Northern section.

Plate 2. The rocky substrate in the background from the north of the Southern section looking north into the Eastern section.

3.2.2 Foraging Habitat

Low tide foraging habitats were either rocky reef platform or sand (Plates 3 & 4). The Central, Near-western, Western and Far Western sections all had sand on the beachward side of the subtidal areas and rocky platform on the seaward side of the subtidal area but the sandy area broadened slightly and the rocky platform area narrowed slightly as one moved westwards. The Eastern section had a broad sandy area on the beachward side and a very extensive rocky reef platform on the seaward side of the intertidal area. The South-eastern section was almost entirely sandy with a very small area of rocky reef platform on the north-east seaward side and a few small patches on the beachward side. The Southern section was almost entirely sandy with just a few small rocky patches on the beachward side.

The survey area lacked the fine intertidal muds that many shorebirds favour for foraging, though muddy areas occurred to the north and south of the survey area, associated with the mouths of the mangrove-lined creeks.

Plate 3. The rocky platform foraging substrate in the Eastern section.

Plate 4. The sandy foraging substrate in the Southern section.

3.2.3 Disturbance

There was moderate disturbance throughout the study area, which is not unexpected given its proximity to Exmouth. All high tide sections had 4WD tracks on the beach and minor litter. At low tide in January there was one 4WD parked on the beach in the Central section, but it departed before low tide counts commenced. Cat (*Felis catus*) and Dog (*Canis familiaris*) tracks were present in the dunes above the beach.

3.3 Bird Abundance and Roost Counts

3.3.1 High Tide Roost Counts

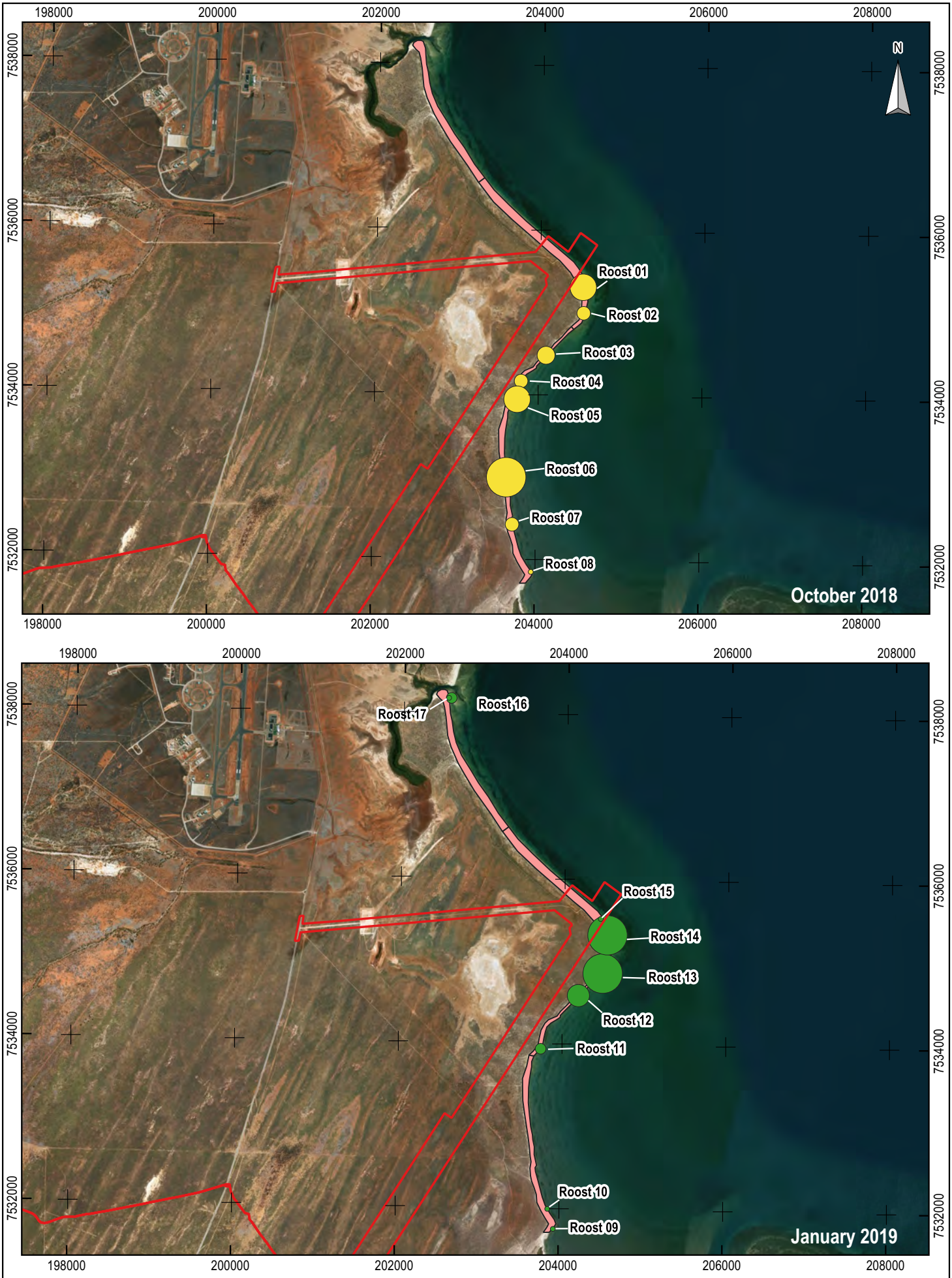
During high tide counts, we recorded 345 individuals of 22 species in October 2018 and 439 individuals of 22 species in January 2019 (Tables 2 and 3, Figure 2). Of these, in October only 179 were migratory shorebirds and in January only 155 were migratory shorebirds, the remaining species including gulls, terns and other non-migratory shorebirds.

During high tide counts, the most common species were Red-capped Plover (105 individuals), Greater Sand Plover (75 individuals) and Grey-tailed Tattler (31 individuals) in October 2018 and Crested Tern (122 individuals), Red-capped Plover (121 individuals) and Greater Sand Plover (67 individuals) in January 2019.

3.3.2 Low Tide Foraging Counts

During low tide counts, we recorded 76 individuals of 16 species in October 2018 and 153 individuals of 17 species in January 2019 (Table 4). Of these, in October only 47 were migratory shorebirds and in January only 78 were migratory shorebirds, the remaining species including gulls, terns and non-migratory shorebirds.

During low tide counts, the most common species were Red-capped Plover (16 individuals), Greater Sand Plover (15 individuals) and Grey-tailed Tattler (14 individuals) in October 2018 and Crested Tern (21 individuals), Greater Sand Plover (21 individuals) and Red-capped Plover (18 individuals) in January 2019. Most of the birds recorded foraging were in the Eastern section (Figure 3, Table 4).



Scale: 1:65000 Original Size: A4 Aerial Photo: ESRI Satellite Grid: EPSG:3857 0 1 2 km	Subsea 7 Learmonth Pipeline Fabrication Facility	**Figure 2** **High Tide Roost Locations**

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Table 2. Birds roosting at high tide, October 2018.

Species	Roost ID									Total observed	1% population criterion	0.1% population criterion
	Outside roost	1	2	3	4	5	6	7	8			
Bar-tailed Godwit		1	15		2					18	3,250	325
Caspian Tern		2							15	17	-	-
Common Greenshank						1				1	1,100	110
Common Sandpiper	3	1					1			5	1,900	190
Crested Tern		4								4	-	-
Eastern Osprey	1									1	-	-
Great Knot					1					1	4,250	425
Greater Sand Plover	8	12		5	2	10	35	3		75	1,100	275
Grey Plover	2	1		1	3	1	3			11	800	80
Grey-tailed Tattler	3	6		11	1	8	2			31	700	70
Gull-billed Tern									3	3	-	-
Lesser Crested Tern		2								2	-	-
Oriental Plover	1									1	2,300	230
Pacific Golden Plover		1								1	1,200	120
Pied Oystercatcher				2					12	14	-	-
Red-capped Plover	25	3			2		18	57		105	-	-
Red-necked Stint		3				10	2	10		25	4,750	475
Ruddy Turnstone	1	1		1			1			4	300	30
Sanderling		3					1			4	300	30
Silver Gull	5	2			1				11	19	-	-
Sooty Oystercatcher	1									1	-	-
Whimbrel					2					2	650	65
Total:	**50**	**42**	**15**	**20**	**14**	**30**	**63**	**70**	**41**	**345**		
Total (migratory shorebirds only):	**18**	**29**	**15**	**18**	**11**	**30**	**45**	**13**	**0**	**179**		

Table 3. Birds roosting at high tide, January 2019.

Species	Roost ID										Total observed	1% population criterion	0.1% population criterion
	Outside roost	9	10	11	12	13	14	15	16	17			
Australian Pelican	1										1	-	-
Bar-tailed Godwit	3				1	1	11	4			20	3,250	325
Common Greenshank	1			1	1		1				4	1,100	110
Common Sandpiper	2			1							3	1,900	190
Crested Tern							117	5			122	-	-
Eastern Reef Egret	1										1	-	-
Great Knot							1				1	4,250	425
Greater Sand Plover	26	1	2	7	1	14	6		7	3	67	1,100	275
Grey Plover	2				1	1	1			1	6	800	80
Grey-tailed Tattler	5				12	7	3				27	700	70
Gull-billed Tern			1				2				3	-	-
Lesser Crested Tern							6				6	-	-
Little Tern								6			6	-	-
Oriental Plover								1			1	2,300	230
Pied Oystercatcher	6	1				4					11	-	-
Red-capped Plover	59	12	29	2		2			8	9	121	-	-
Red-necked Stint			1			2	6				9	4,750	475
Ruddy Turnstone						8					8	300	30
Sanderling	1					1	1				3	300	30
Silver Gull	7	1					2				10	-	-
Sooty Oystercatcher					1	2					3	-	-
Whimbrel	1				4		1				6	650	65
Total	**115**	**15**	**33**	**11**	**21**	**42**	**158**	**16**	**15**	**13**	**439**		
Total (migratory shorebirds only):	**41**	**1**	**3**	**9**	**20**	**34**	**31**	**5**	**7**	**4**	**155**		

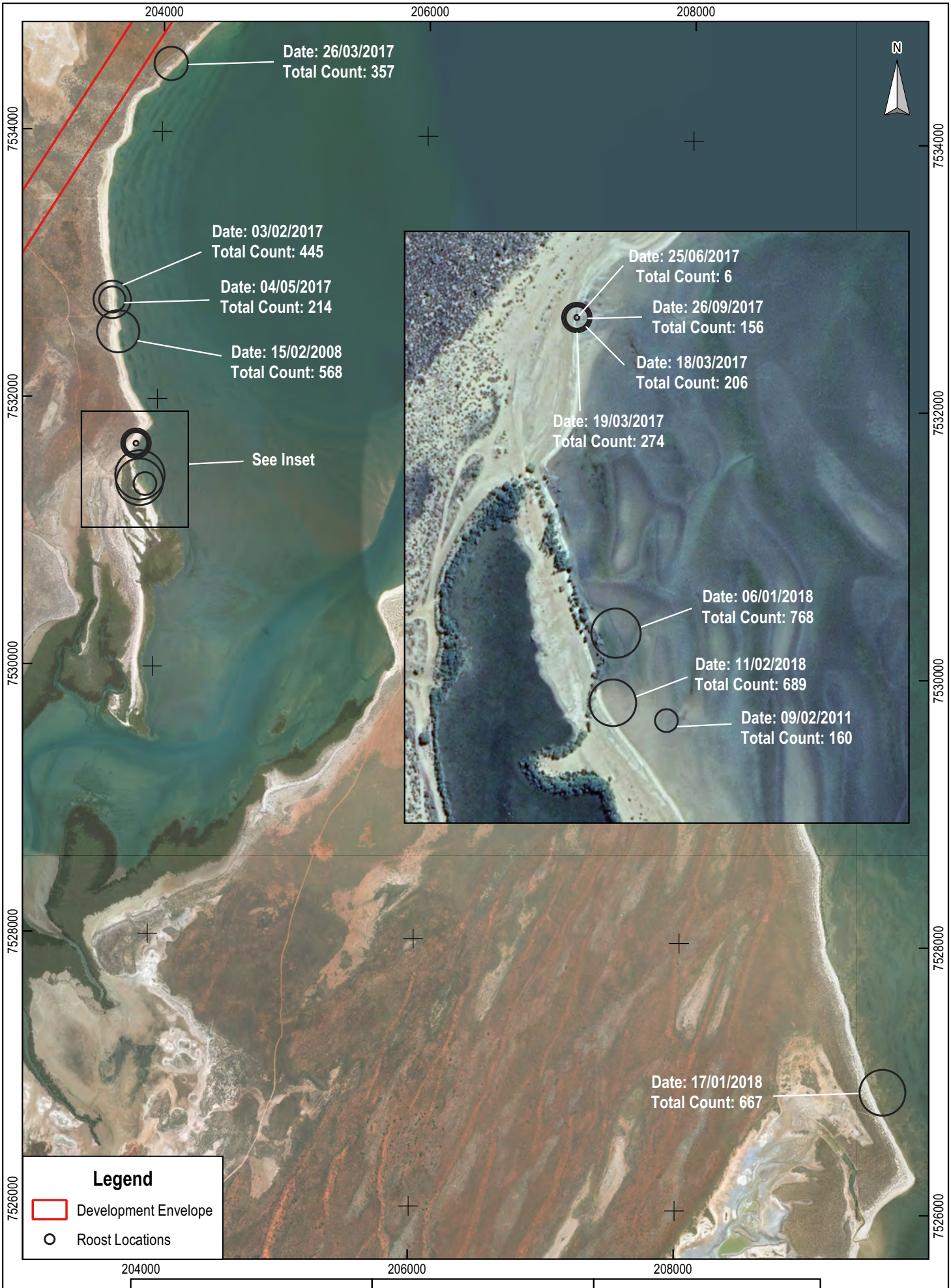
Table 4. Low Tide counts of Foraging birds, October 2018 and January 2019.

Species	Low Tide Foraging Zone														Total		1% population criterion	0.1% population criterion
	Far Western		Western		Near Western		Central		Eastern		South-eastern		Southern					
	Oct	Jan	Oct	Jan	Oct	Jan	Oct	Jan	Oct	Jan	Oct	Jan	Oct	Jan	Oct	Jan		
Australian Pelican			1												1		-	-
Bar-tailed Godwit		1								6	3	6	2	1	5	14	3,250	325
Caspian Tern									2	1					2	1	-	-
Common Greenshank									1	1	1		1	2	3	3	1,100	110
Common Sandpiper									1						1		1,900	190
Crested Tern									3	21					3	21	-	-
Eastern Reef Egret										1						1	-	-
Great Knot											1		1		2		4,250	425
Greater Sand Plover	1	2		1			2		8	8	1	3	3	7	15	21	1,100	275
Grey Plover											2		1		3		800	80
Grey-tailed Tattler		1		1	1		1	1	11	8			1		14	11	700	70
Little Tern										3						3	-	-
Pied Cormorant										3						3	-	-
Pied Oystercatcher										5	1	2	3		4	7	-	-
Red-capped Plover	3	4	1	2	2	1	2	1	2	8	3		3	2	16	18	-	-
Red-necked Stint										4						4	4,750	475
Ruddy Turnstone									1	16					1	16	300	30
Sanderling										8			1		1	8	300	30
Silver Gull		1						2		4		3	3	5	3	15	-	-
Sooty Oystercatcher		3								3						6	-	-
Whimbrel									1	1			1		2	1	650	65
Total:	**4**	**12**	**2**	**4**	**3**	**1**	**5**	**4**	**30**	**101**	**12**	**14**	**20**	**17**	**76**	**153**		
Total (migratory shorebirds only):	**1**	**4**	**-**	**2**	**1**	**-**	**3**	**1**	**23**	**52**	**8**	**9**	**11**	**10**	**47**	**78**		

Table 5. Birds Australia Shorebirds 2020 counts for the Bay of Rest.

Note: Shaded counts are those that meet or exceed the 0.1%flyway population criterion.

Shorebirds 2020 Site ID and Name	Date of Survey	Bar-tailed Godwit	Black-winged Stilt	Common Greenshank	Common Sandpiper	Curlew Sandpiper	Eastern Curlew	Great Knot	Greater Sand Plover	Grey Plover	Grey-tailed Tattler	Lesser Sand Plover	Marsh Sandpiper	Medium wader spp	Oriental Plover	Pacific Golden Plover	Red-kneed Dotterel	Red-necked Stint	Ruddy Turnstone	Sanderling	Sharp-tailed Sandpiper	Terek Sandpiper	Whimbrel	Total Count
1% Flyway Population criteria:		**3250**	**-**	**1100**	**1900**	**900**	**350**	**4250**	**2000**	**800**	**700**	**1800**	**1300**	**-**	**2300**	**1200**	**-**	**4750**	**300**	**300**	**850**	**500**	**650**	
0.1% Flyway Population criteria:		**325**	**-**	**110**	**190**	**90**	**350**	**425**	**200**	**80**	**70**	**180**	**130**	**-**	**230**	**120**	**-**	**475**	**30**	**30**	**85**	**50**	**65**	
627246 Bay of Rest North	15/02/2008	66	2	34			10	140	130	2	70					1		14	5	76			18	568
636851 Bay of Rest	9/02/2011	43		2				38	32	7	17					2			2	15		1	1	160
648238 Bay of Rest North	3/02/2017	139		15	1			59	52	9	34	6		6		1		12	8	82			21	445
	4/05/2017	44		9			2	50	14	2	63	26							1				3	214
649932 Bay of Rest North	18/03/2017	46		40		18		25		3	70							3					1	206
	19/03/2017	80		45		2	20	38		2	70							12					5	274
	25/06/2017		1											1			3						1	6
	26/09/2017	66		7	1				62	2		1						8		4	1		4	156
650374 Bay of Rest North	26/03/2017	200		45		2	11	50		3	2			30									14	357
693797 Bay of Rest North	6/01/2018	127	1	35	14	16		149	72	39	97	29	2		76	2		52	12	2		34	9	768
696811 Bay of Rest South	17/01/2018	455						62	52	7	56							19	14				2	667
701202 Bay of Rest North	11/02/2018	494		15		4	17	58	20	5										24			52	689



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Original Size: A4
Aerial Photo: ESRI Satellite
Grid: EPSG:3857
0 0.5 1 km

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Figure 3

Birdlife Australia shorebird counts in the Bay of Rest

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4. Discussion

4.1 Threatened Species

The Great Knot was recorded during the survey, and this species is listed as Critically Endangered under the EPBC Act. Single birds were recorded roosting in each survey, and two birds were recorded foraging in October 2018 (Tables 2, 3 and 4).

The key threats to this species is loss of intertidal mudflats in its flyway, particularly in the Yellow Sea between China and Korea, which is thought to be large contributor to this species' decline (TSSC 2016). In Australia, key threats are coastal developments, habitat degradation and human disturbance (TSSC 2016). There is no recovery plan for this species, but the Threatened Species Scientific Committee (TSSC 2016) provides a list of conservation and management actions Recommended actions for the Red Knot include protecting important habitat in Australia, including maintaining and improving protection for Australian roosting and feeding sites (TSSC 2016).

The counts of Great Knot on this survey were very low and did not approach nationally or Internationally significant criteria. Nearby counts in the Bay of Rest obtained from Shorebirds2020 data include several counts >50 and a count of 149 birds in January 2018 (Table 5), indicating that larger numbers of this species occur nearby. This species forages on large areas of intertidal mudflats or sandflats on sheltered coastlines, and is less likely to occur on rock platforms and shorelines with mangrove vegetation (TSSC 2016). The Great Knot prefers to roost in open areas (TSSC 2016), so the shoreline in the survey area may not represent ideal roosting habitat as it is relatively exposed and the narrow shoreline would result in birds roosting close to the dunes.

The Eastern Curlew is also listed as Critically Endangered under the EPBC Act. Although it was not recorded during this survey, small numbers (2 to 20 birds) have previously been recorded in the Bay of Rest (Table 5). This species favours sheltered coasts with large intertidal mudflats or sandflats for foraging, only occasionally occurring on ocean beaches and rocky platforms (DoE 2015a). The low nearby counts and generally exposed habitat suggest that the survey area is unlikely to be favoured by the Eastern Curlew.

4.2 Important Site Criteria

In this survey, no counts of any migratory species exceeded the internationally or nationally significant criteria of 1% or 0.1% of the flyway population, respectively. Total counts of migratory shorebirds were well below the internationally significant threshold of 20,000 birds and the nationally significant threshold of 2,000 birds, with the highest count of 179 birds achieved at high tide roost sites in October. No more than 13 migratory shorebird species were recorded in this survey, less than the >15 species that indicates a nationally important site.

Although bird counts on this survey did not exceed any nationally or internationally significant criteria, previous surveys in the Bay of Rest have returned nationally significant counts of Bar-tailed Godwit, Grey-tailed Tattler and Sanderling (Figure 3, Table 5). The locations of these surveys are represented by point counts, so the area covered by each count is indeterminate. The counts indicate that larger groups of birds occur in the vicinity of the survey area, though still much lower than the 2,000 bird nationally significant threshold.

The habitats of the survey area clearly support small numbers of shorebirds, as observed in this study. However, the habitats may be less suitable for shorebirds compared with other parts of the Exmouth Gulf, that have wider and/or more sheltered beaches with islets or sandbars for roosting and muddier substrates for foraging birds at low tide.

5. References

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