

**A SURVEY OF THE BIRDS UTILISING
THE INTERTIDAL AREAS ADJACENT
TO THE PROPOSED NEW BRISBANE AIRPORT RUNWAY
IN NOVEMBER 2003 AND FEBRUARY 2004**

Report prepared for Brisbane Airport Corporation

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On behalf of the Queensland Wader Study Group

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1. Introduction

The Brisbane Airport Corporation Limited (BAC) is in the preliminary stages of planning for the construction of a new runway parallel to the existing 01/19 runway. It is intended that the new runway will be sited 2000 metres west of the existing facility with the seaward end close to the Bramble Bay foreshore.

Moreton Bay Marine Park supports over 50,000 migratory waders of 35 species, making it one of the most important sites in Queensland. The proposed runway site may adversely impact the Moreton Bay Marine Park and the Moreton Bay Ramsar site. If this potential impact could occur, BAC is obliged to assess these impacts under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*. BAC has commissioned the Queensland Wader Study Group (QWSG) to investigate and report on the density and composition of the wader populations in the intertidal zone adjacent to the proposed new runway. In addition, BAC requested that information on wader numbers using nearby roost sites be made available from the QWSG database. The survey team also decided to carry out two low tide surveys on the adjacent Nudgee Beach foreshore for comparative purposes.

2. METHODS

2.1 Low tide surveys

Low tide surveys of waders on the intertidal flats adjoining Brisbane Airport and Nudgee Beach were undertaken over three and two days, respectively, in November 2003 and February 2004. The period of surveys represents the non-breeding season for migratory waders.

For the Brisbane Airport survey, the limits of the survey area were from the mouth of the Kedron Brook Floodway (27° 20.95' S 153° 6.76' E), east for approximately 2000 metres to an obvious inlet at the end of the rock seawall (27° 21.58' S 153° 8.03' E), which corresponded with the old mouth of Serpentine Creek. The limits of the survey area matched those of obvious landmarks and covered a lateral distance of approximately 1000 metres on either side of the extended centre line of the proposed new runway.

For Nudgee Beach, the limits of the survey were from the eastern bank of Cabbage Tree Creek to the western bank of the Kedron Brook Floodway, a distance of approximately 2500 metres. Nudgee Beach was chosen as a second site to survey because it was near the proposed runway and had similar substrate and slope. The centre of the site was approximately 1500 metres west of the proposed new runway. The two sizes of the two sites (Brisbane Airport and Nudgee Beach foreshores) surveyed were approximately equal.

Surveys were undertaken on the foreshore by two observers with tripod mounted telescopes (one 25 × 60mm and one zoom scope set at approximately 30 ×).

Areas were defined by the lateral limits noted above and the available intertidal zone at low tide and during the rising tide that followed. Each survey took about three hours of actual observation time although no times were logged. The surveys started at one of the physical limits and proceeded to the opposite end. Two observers identified and counted all bird species, particularly waders. Another person recorded progressive numbers of birds counted and assisted in keeping track of birds moving into and within the site. This enabled the survey team to avoid errors in double counting, as far as possible.

2.2 High tide surveys

A roost site that previously existed at the old Serpentine Creek mouth (the eastern limit of the Brisbane Airport low tide survey area) was examined just after high tide on 23 February 2004 (high water at the Brisbane Bar was 2.31m at 11:32 hrs).

3. RESULTS

3.1 Low tide surveys

Brisbane Airport

A total of 32 species of bird, including 14 migratory and two resident wader species, were observed using the intertidal zone adjacent to BAC controlled land for feeding and/or resting at or either side of low tide (Table 1). On the three survey dates, daily counts were 244, 270 and 494 birds, of which 190 (77.8%), 213 (78.9%) and 313 (63.4%) were wader species. The variation in numbers between the first and third count was marked. This could partly be because of an influx of migratory waders in February at the beginning of northwards migration, although it was probably a little early in the season for this. Large numbers of Common Tern, a northern hemisphere migrant, were also observed on the last survey date (2/2/04).

The most common wader species observed over the three survey dates were Curlew Sandpiper (16.9% of total waders), Pacific Golden Plover (15.4% of total waders), Bar-tailed Godwit (13.8% of total waders), Sharp-tailed Sandpiper (13.4% of total waders), Red-necked Stint (12.4% of total waders), Eastern Curlew (7.5% of total waders) and Whimbrel (7.0% of total waders). All seven species are summer migrants. In addition, two species of resident wader, Red-capped Plover and Pied Oystercatcher, were observed. Both species breed in Moreton Bay, and could conceivably nest on BAC land, although no evidence of breeding was found. A number of other bird species, including raptors, egrets, gulls, terns, cormorants and pelicans frequented the area. Of these species, the most notable were Common Tern and Little Tern.

Several bird species that were expected to be seen but were not recorded included Masked Lapwing, Black-winged Stilt, Chestnut Teal and Great Egret. All of these

species normally occur in this type of habitat and we expect other resident and migrant species also to use the area during different times of the year.

Nudgee Beach

A total of 22 species of bird was observed at Nudgee Beach over the two days, of which nine were migratory wader species, two were resident wader species and the balance were waterbird, seabird and raptor species (Table 2). On the two survey dates, the daily counts were 452 and 704, of which 376 (83.2%) and 540 (76.7%) were wader species. The most common waders species observed were Curlew Sandpiper (33.2% of total waders), Bar-tailed Godwit (21.4% of total waders), Whimbrel (13.5% of total waders), Pacific Golden Plover (10.6% of total waders) and Red-necked Stint (8.5% of total waders).

3.2 High tide surveys

Waders are denied access to their feeding grounds at high tide. During this time, they group in quite large numbers at suitable areas above or close to high water mark. These areas are known as roosts. Protection of roosts is of considerable importance to the birds' well-being as they rest and digest their food from the previous tidal cycle.

Most of the foreshore adjacent to the airport is bounded by a rock wall. At all but the lowest of high tides, water laps up against the wall and does not provide any roosting area. Only Grey-tailed Tattlers have been observed to roost on rock walls at the Port of Brisbane.

No birds were observed to roost at the old mouth of Serpentine Creek, a site previously utilised many years ago. It appears that the shoreline topography has changed and no viable roost site now exists at this location.

3.3 Other Roost Sites

As requested by BAC, data on two high tide roost sites that are in relatively close proximity to the airport survey area are presented in Table 2. These data have been extracted from the QWSC's records.

The two roost sites involved are: the Port of Brisbane Authority area and the Pine Rivers wetlands near the mouth of the North Pine River. The Port of Brisbane Authority site information has been made available with the permission of the POBA.

Another known roost site that is near the survey area is located at Luggage Point. However, no current figures are available as this site is within the Brisbane City Council sewerage treatment plant lands. Earlier counts at this site (2001-2002) indicated that numbers of waders were quite variable.

3.4 Flight Paths and Altitudes

Waders were noted arriving and departing the Brisbane Airport survey area parallel to the shoreline in both directions at low altitudes – in the order of 5 to 10 m. Larger flocks flying at higher altitudes may occur, particularly at the beginning or end of migration. Whether this occurs at this site is not known at this time. No significant flock flights were noted during the survey.

Flight at higher altitudes will also occur with certain endemic species such as pelicans and raptors. In this regard, the situation with the new runway will be little different to that at the seaward end of the existing 01/19 runway. However, we note that the end of the proposed runway is planned to be much closer to the shoreline than the existing facility. The existing runway is displaced approximately 1500 m from the beach. This may have some operational significance.

4. CONCLUSIONS

In total, 14 migratory wader species and two migratory tern species (Common Tern and Little Tern) were recorded on low tide surveys of the Brisbane Airport foreshore. These species are listed under the *Environment Protection and Biodiversity Conservation Act 1999*, and any development having a significant impact on these species would require the approval of the Commonwealth Environment Minister following an environmental impact assessment. To our knowledge, comparable low tide data on the abundance of wader species, with the possible exception of Eastern Curlew (P. Finn, personal communication), is not available for other parts of Moreton Bay. This does not allow any conclusions to be made about the relative quality of the feeding habitat in the intertidal area next to the Brisbane Airport. To provide these data would require a much larger project and may not necessarily result in a change in the environmental impact assessment process. The area surrounding the mouth of the Brisbane River is generally regarded as being important for waders. The roost site at the Port of Brisbane is the largest in Moreton Bay (QWSG, unpublished data), and it is expected that birds would fan out in both northerly and southerly directions for a distance of about 5 km from the roost site when feeding.

During our surveys, we did not find any significant roost sites within or adjacent to the BAC land. A roost site that previously existed at the mouth of Serpentine Creek was no longer utilised. However, QWSG has found that utilisation of roost sites changes with time. Many of the roost sites along the Brisbane foreshore have been lost due to urban development, and those remaining, such as at the Port of Brisbane and Manly Boat Harbour are artificial. A major roost site previously existed where dredge spoil was dumped on Dynah Island in the Boondall Wetlands. However, this site is no longer utilised because of mangrove colonisation and erosion. It is conceivable that earthworks during development of the second runway could temporarily create habitat favourable for roosting, especially if landfill was left to settle for significant lengths of time. The inadvertent creation of a roost site in the vicinity of the existing runway would create a public safety issue, as low flying flocks of waders going to and from the roost may cross

aircraft flight paths. Diversionary projects could be considered, such as the creation of artificial roost sites at locations away from the airport.

During the surveys, we found that waders were not distracted from feeding by the noise and shadows of low flying aircraft. The impacts of the second runway on waders during and after development are more likely to be indirect rather than direct and related to issues such as the clearance of mangroves and pollution, which affect the abundance of the invertebrates on which they feed.

Regular monitoring of the BAC site for waders is not recommended as the site currently does not retain birds during high tide. However, follow-up surveys closer to the beginning of the runway project would be warranted and the Queensland Wader Study Group is happy to be contacted to assist with these surveys.

5. References

Christidis, L., & W.E. Boles 1994. *The Taxonomy and Species of Birds of Australia and its Territories. Royal Australasian Ornithologists Union Monograph 2*. RAOU, Melbourne.

Table 1. Birds counted on the Brisbane Airport and Nudgee Beach foreshores on several dates in November 2003 and February 2004, (Low tide surveys).

Species	Airport Foreshore			Nudgee Beach	
	19/11/03 ¹	20/11/03 ²	02/02/04 ³	19/11/03 ¹	23/02/04 ⁴
Little Pied Cormorant (<i>Phalacrocorax melanoleucos</i>)	13	-	-	-	-
Pied Cormorant (<i>Phalacrocorax varius</i>)	1	12	24	-	1
Little Black Cormorant (<i>Phalacrocorax sulcirostris</i>)	-	1	-	-	-
Great Cormorant (<i>Phalacrocorax carbo</i>)	-	-	1	-	-
Australian Pelican (<i>Pelecanus conspicillatus</i>)	3	2	2	-	-
White-faced Heron (<i>Egretta novaehollandiae</i>)	1	-	1	2	-
Little Egret (<i>Egretta garzetta</i>)	-	1	1	2	3
Australian White Ibis (<i>Threskiornis molucca</i>)	-	-	-	3	-
Osprey (<i>Pandion haliaetus</i>)	1	2	1	-	2
Whistling Kite (<i>Haliastur sphenurus</i>)	-	-	-	1	1
Brahminy Kite (<i>Haliastur indus</i>)	1	-	-	-	-
White-bellied Sea Eagle (<i>Haliaeetus leucogaster</i>)	-	-	2	-	-
Bar-tailed Godwit (<i>Limosa lapponica</i>)	49	16	34	83	113
Whimbrel (<i>Numenius phaeopus</i>)	16	12	22	74	50
Eastern Curlew (<i>Numenius madagascarensis</i>)	24	15	15	10	32
Common Greenshank (<i>Tringa nebularia</i>)	1	1	-	5	2
Grey-tailed Tattler (<i>Heteroscelus brevipes</i>)	-	-	1	-	-
Ruddy Turnstone (<i>Arenaria interpres</i>)	1	-	2	-	-
Great Knot (<i>Calidris tenuirostris</i>)	1	10	8	-	40
Red Knot (<i>Calidris canutus</i>)	3	-	-	-	-
Red-necked Stint (<i>Calidris ruficollis</i>)	14	12	63	5	73
Sharp-tailed Sandpiper (<i>Calidris acuminata</i>)	37	59	-	-	-
Curlew Sandpiper (<i>Calidris ferruginea</i>)	24	58	39	153	151
Pied Oystercatcher (<i>Haematopus longirostris</i>)	4	2	2	-	-
Pacific Golden Plover (<i>Pluvialis fulva</i>)	11	23	76	40	57
Grey Plover (<i>Pluvialis squatarola</i>)	-	-	2	-	-
Red-capped Plover (<i>Charadrius ruficapillus</i>)	5	5	5	3	1
Lesser Sand Plover (<i>Charadrius mongolus</i>)	-	-	44	-	21
Masked Lapwing (<i>Vanellus miles</i>)	-	-	-	3	-
Silver Gull (<i>Larus novaehollandiae</i>)	25	27	32	53	107

Species	Airport Foreshore			Nudgee Beach	
	19/11/03 ¹	20/11/03 ²	02/02/04 ³	19/11/03 ¹	23/02/04 ⁴
Gull-billed Tern (<i>Sterna nilotica</i>)	-	-	3	2	-
Caspian Tern (<i>Sterna caspio</i>)	-	4	4	12	1
Crested Tern (<i>Sterna bergii</i>)	4	5	2	1	8
Common Tern (<i>Sterna hirundo</i>)	5	1	95	-	-
Little Tern (<i>Sterna albifrons</i>)	-	2	13	-	41
Total birds	244	270	494	452	704
Number of species observed each day	22	21	26	17	18

¹Wind south-easterly to 3 knots, cloud cover 2/5

²Wind north-easterly to 8 knots, cloud cover 1/5

³Wind north-westerly to 2 knots, overcast.

⁴Wind south-easterly to 8 knots, cloud cover variable

Table 2. High tide roost counts at Port of Brisbane Authority site and Pine Rivers wetlands between November 2003 and February 2004.

Species	Port of Brisbane Authority site		Pine Rivers wetlands	
	Nov 2003	Feb 2004	Nov 2003	Jan 2004
Black Swan (<i>Cygnus atratus</i>)	20	14	-	-
Australian Wood Duck (<i>Chenonetta jubata</i>)	16	-	-	-
Pacific Black Duck (<i>Anas superciliosa</i>)	15	-	-	-
Grey Teal (<i>Anas gracilis</i>)	64	-	-	-
Chestnut Teal (<i>Anas castanea</i>)	403	36	-	7
Hardhead (<i>Aythya australis</i>)	37	-	-	-
Little Pied Cormorant (<i>Phalacrocorax melanoleucus</i>)	1	-	-	-
Pied Cormorant (<i>Phalacrocorax varius</i>)	9	1	-	-
Little Black Cormorant (<i>Phalacrocorax sulcirostris</i>)	10	7	-	-
Australian Pelican (<i>Pelecanus conspicillatus</i>)	100	127	-	-
White-faced Heron (<i>Egretta novaehollandiae</i>)	-	1	2	9
Little Egret (<i>Egretta garzetta</i>)	1	5	-	-
Great Egret (<i>Egretta alba</i>)	1	-	1	1
Striated Heron (<i>Butorides striatus</i>)	-	1	-	-
Australian White Ibis (<i>Threskiornis molucca</i>)	11	1	3	17
Royal Spoonbill (<i>Platalea regia</i>)	60	1	-	1
Osprey (<i>Pandion haliaetus</i>)	2	1	-	-
Whistling kite (<i>Haliastur sphenurus</i>)	-	-	-	1
Buff-banded Rail (<i>Gallirallus philippensis</i>)	1	-	-	-
Purple Swamphen (<i>Porphyrio porphyrio</i>)	9	-	-	-
Dusky Moorhen (<i>Gallinula tenebrosa</i>)	11	-	-	-
Eurasian Coot (<i>Fulica atra</i>)	38	-	-	-
Black-tailed Godwit (<i>Limosa limosa</i>)	3	-	31	246
Bar-tailed Godwit (<i>Limosa lapponica</i>)	12	113	-	371
Whimbrel (<i>Numenius phaeopus</i>)	70	1	54	27
Eastern Curlew (<i>Numenius madagascariensis</i>)	244	193	29	37
Marsh Sandpiper (<i>Tringa stagnatilis</i>)	5	2	4	17
Common Greenshank (<i>Tringa nebularia</i>)	4	1	13	54
Terek Sandpiper (<i>Xenus cinereus</i>)	2	4	-	-
Grey-tailed Tattler (<i>Heteroscelus bryipes</i>)	468	277	-	-
Ruddy Turnstone (<i>Arenaria interpres</i>)	46	14	-	-
Great Knot (<i>Calidris tenuirostris</i>)	7	81	12	34
Red Knot (<i>Calidris canutus</i>)	17	1	-	1
Red-necked Stint (<i>Calidris ruficollis</i>)	3625	1623	-	1
Sharp-tailed Sandpiper (<i>Calidris acuminata</i>)	468	110	54	78
Curlew Sandpiper (<i>Calidris ferruginea</i>)	1419	489	-	128
Broad-billed Sandpiper (<i>Limicola fulcinellus</i>)	-	1	-	-
Pied Oystercatcher (<i>Haematopus longirostris</i>)	21	93	-	-
Black-winged Stilt (<i>Himantopus himantopus</i>)	45	2	6	48
Red-necked Avocet (<i>Recurvirostra novaehollandiae</i>)	159	1	-	-
Pacific Golden Plover (<i>Pluvialis fulva</i>)	398	455	18	97
Grey Plover (<i>Pluvialis squatarola</i>)	38	40	-	-

Species	Port of Brisbane Authority site		Pine Rivers wetlands	
	Nov 2003	Feb 2004	Nov 2003	Jan 2004
Red-capped Plover (<i>Charadrius ruficapillus</i>)	91	103	-	16
Double-banded Plover (<i>Charadrius bicinctus</i>)	-	1	-	-
Lesser Sand Plover (<i>Charadrius mongolus</i>)	898	519	-	-
Greater Sand Plover (<i>Charadrius leschenaultii</i>)	8	404	-	-
Black-fronted Dotterel (<i>Euseyornis melanops</i>)	1	-	-	-
Red-kneed Dotterel (<i>Erythrogonys cinctus</i>)	5	-	-	1
Masked Lapwing (<i>Vanellus miles</i>)	-	-	4	34
Silver Gull (<i>Larus novaehollandiae</i>)	173	235	-	-
Gull-billed Tern (<i>Sterna nilotica</i>)	87	-	-	7
Caspian Tern (<i>Sterna caspia</i>)	57	39	-	1
Crested Tern (<i>Sterna bergii</i>)	2	1	-	-
Common Tern (<i>Sterna hirundo</i>)	2	-	-	-
Little Tern (<i>Sterna albifrons</i>)	310	544	-	-
Whiskered Tern (<i>Chlidonias hybridus</i>)	1	-	-	-
Total birds	9495	5542	231	1234
Total species each day	50	38	13	24