



APPENDIX 04

# Waterbirds of Upper Spencer Gulf



## 04 WATERBIRDS OF UPPER SPENCER GULF

### 04.1 INTRODUCTION

For the purposes of this study Upper Spencer Gulf is defined as the gulf waters north of an east–west line near Point Jarrold (Figure 04.1). However, it is recognised that impacts to the marine environment in this region have the potential to affect waterbirds throughout the remainder of the Gulf. Also, as a point of clarification, waterbirds described here include waterbirds *per se* (e.g. Ducks and Grebes) and migratory wader birds (e.g. Plovers and Curlews).

Waterbird surveys in the study region are largely confined to counts of waders, with some information available on nesting colonies of other species.

From 1981 to 1985, the Royal Australasian Ornithologists Union (RAOU) conducted surveys of waders to estimate total numbers across Australia (Lane 1987). Waders are defined as waterbirds belonging to the families Scolopacidae (Snipe, Godwits, Curlews, Sandpipers, Stints and Phalaropes), Haematopodidae (Oystercatchers), Recurvirostridae (Stilts and Avocets) and Charadriidae (Plovers, Dotterels and Lapwings) and include species that are either resident in Australia (i.e. resident) or breed elsewhere, chiefly in the Northern Hemisphere (i.e. migratory). The surveys included many sites across South Australia, including ground and aerial surveys of Upper Spencer Gulf (Lane 1983, 1987). These surveys led Watkins (1993) to conclude that Spencer Gulf was of particular international significance to migratory waders. More recently, Wilson (2000) reassessed several important or poorly covered sites in South Australia, including Spencer Gulf. This included a survey by micro-light aircraft to identify key sites that could be more accurately surveyed from the ground. Sites were counted at high tide when birds are concentrated at roosts. It should also be noted that wader populations vary throughout the year and between years, although the highest concentrations in Australia occur in January–February, when counts are usually conducted.

No systematic survey has been undertaken of other waterbirds that use Upper Spencer Gulf. Parker and others (1979) list sites of breeding colonies of waterbirds in the region. Copley (1996) provides information on seabird colonies in the Spencer Gulf region as part of a review of seabird status in South Australia. Wilson (2000) recorded the locations of waterbird breeding colonies (see above) and Baker (2004) includes an assessment of bird life in a review of potential marine protected areas across South Australia.

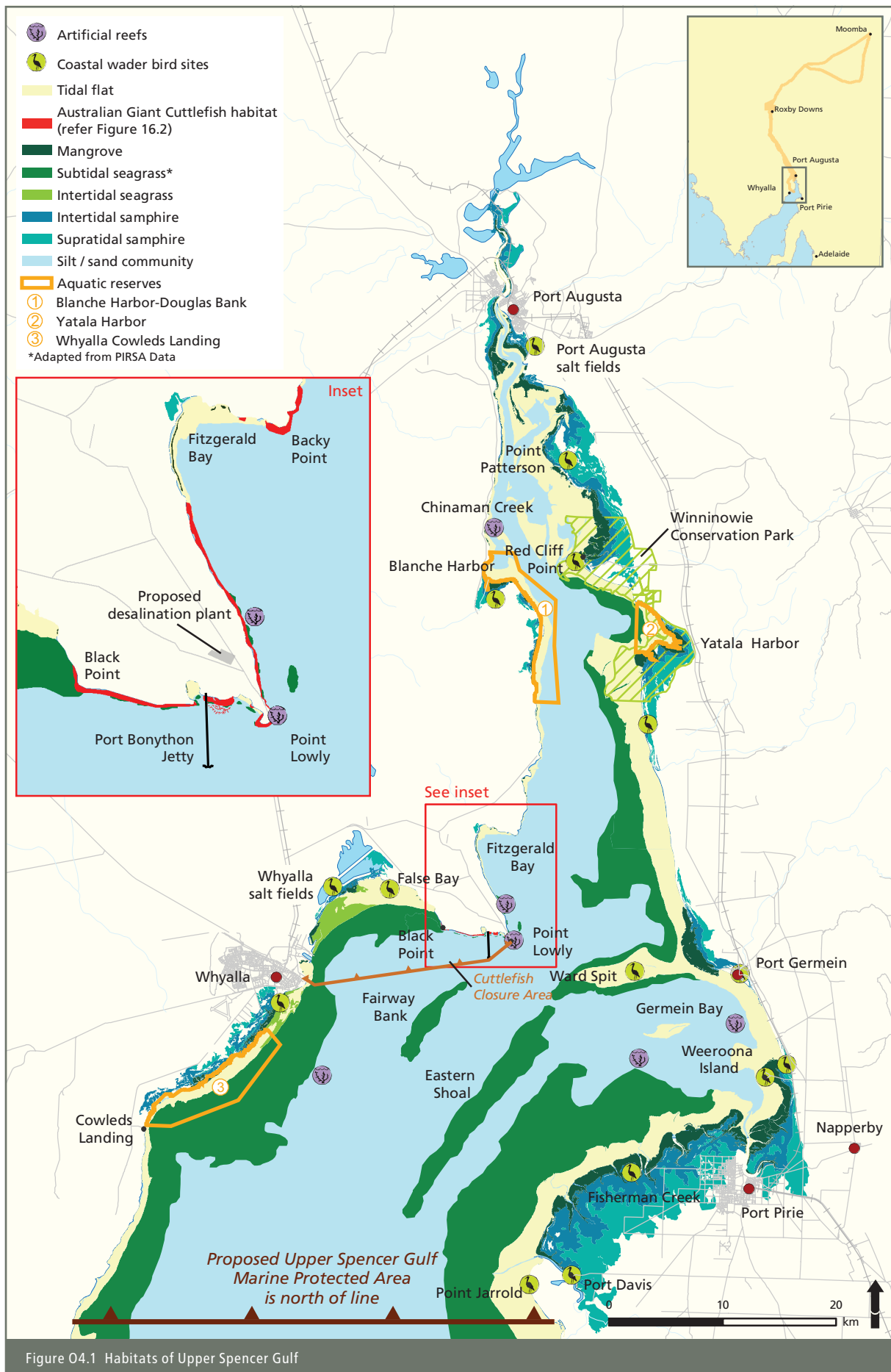


Figure O4.1 Habitats of Upper Spencer Gulf

## 04.2 RESULTS

Wader counts indicate that Upper Spencer Gulf can support more than 30,000 waders over the summer period when migratory waders are present (Attachment O4.1 – data from Lane 1983, 1987; Wilson 2000). They feed mostly on invertebrates obtained from tidal mud and sand flats at low tide, and roost on spits, islands and saltfields at high tide. About two-thirds consist of migratory species, dominated by Red-necked Stint (6,500), Red Knot (6,000), Sharp-tailed Sandpiper (2,000) and Curlew Sandpiper (2,500), while resident species are dominated by the Banded Stilt (8,500) and Red-capped Plover (1,500). The numbers of Banded Stilts may be higher at times (50,000+), when they disperse to and from inland breeding sites (see Baxter 2003 for details). The area including Upper Spencer Gulf and extending 60 km south to Cowell and Wallaroo supports most of the total number of waders that occur in the whole of Spencer Gulf.

The most important wader roosting sites in Upper Spencer Gulf are at Ward Spit, 10 km south of Port Davis, Point Jarrold, Ward Point to Yatala Harbour, Red Cliff Point, Port Augusta Saltfields, and Whyalla Saltfields (Figure O4.1). The nearest of these sites to the proposed locations of infrastructure for the Olympic Dam expansion is Ward Spit, about 5 km from the proposed Point Lowly desalination plant. Wilson (2000) noted few waders feeding on areas of sandy substrate, with most feeding in more muddy areas behind the mangroves between Port Pirie and Port Davis.

Watkins (1993) showed that Spencer Gulf was internationally important for 10 species and nationally important for a further two. Wilson (2000) concluded that the year 2000 counts were lower than the 1983 surveys, although the gulf was still important for nine species and nationally important for one, with the eastern shores the most significant and worthy of Ramsar site nomination. Species of particular significance with approximate populations in Upper Spencer Gulf are: Pied Oystercatcher, (150), Grey Plover (500), Red-capped Plover (1,500), Banded Stilt (8,500), Red Knot (6,000), Sharp-tailed Sandpiper (2,000), Red-necked Stint (6,500) and Curlew Sandpiper (2,500).

Surveys of other waterbirds indicate that there are several large breeding colonies of mainly Pied Cormorants (often mixed with smaller numbers of Little Pied Cormorants and Great Egrets) in mangroves at Port Pirie (several sites) and Red Cliff Point (Chinaman Creek) (Copley 1996; Wilson 2000). The total number of breeding pairs of Pied Cormorants in the area including Upper Spencer Gulf and extending 60 km south to Cowell and Wallaroo is estimated at 3,260 (data from Copley 1996 – Attachment O4.2). Ward Spit also supports nesting colonies of terns (Crested, Caspian and Fairy) and Silver Gulls.

Other waterbirds that occur in Upper Spencer Gulf are listed in Attachment O4.3. No details are available on the numerical abundance of these species. A number of other species (with no known records) that may occur are listed in Attachment O4.4.

## 04.3 DISCUSSION

### 04.3.1 Significance of region to waterbirds

Results of Australia-wide counts indicate that Upper Spencer Gulf has international, national and state significance as a habitat for waders, and is one of the most important sites in South Australia (Watkins 1993). This significance is due to species diversity, total numbers and relative numbers. The most important areas appear to be along the east coast between Point Jarrold and Red Cliff Point, and at the saltfields at Port Augusta and Whyalla (see Figure O4.1). The greatest numbers of waders occur over the summer period following the migration of species that breed in the Northern Hemisphere. A percentage of these (i.e. the young birds) remain in the region over winter. Most species feed on invertebrates (found in the substrate on intertidal mud and sandflats at low tide), and concentrate at roosts on islands, spits and saltfields at high tide. A few species (especially Banded Stilts) also feed within saltfields. The closest significant feeding site to the proposed infrastructure for the Olympic Dam expansion is Ward Spit, about 5 km east of the proposed desalination plant.

The area including Upper Spencer Gulf and extending 60 km south to Cowell and Wallaroo also supports significant waterbird breeding colonies. This includes about a third of the state's Pied Cormorants, 20% of Fairy Terns and 7% of Caspian Terns. There may also be other significant waterbird colonies in the region (e.g. Great Egrets – Wilson 2000) but these are yet to be properly assessed. The most important sites are Ward Spit and the mangroves along the east coast between Wallaroo and Red Cliff Point, plus Franklin Harbour (see Figure O4.1). Cormorants and terns feed primarily on small fish obtained in open water and tidal channels, while the Great Egret feeds on a variety of aquatic vertebrates and invertebrates obtained in shallow water.

### 04.3.2 Waterbirds of conservation significance

Upper Spencer Gulf supports many waterbirds of conservation significance at state and national levels. Among these, the region has significant numbers of Eastern Curlew and Fairy Tern, the latter with possibly the largest breeding colony in South Australia at Ward Spit. In addition, the Little Tern (which is state listed as vulnerable) has been recorded at Ward Spit.

The national and state conservation status of the Banded Stilt is being re-assessed on the basis of significantly reduced breeding success in recent years, due to predation of eggs and young by Silver Gulls. Upper Spencer Gulf provides a staging area for movements to and from breeding sites at Lake Torrens and Lake Eyre.

### 04.3.3 Impacts of the proposed desalination plant

The proposed works would not have a direct impact on waterbirds as none of the important roosting sites or significant feeding sites would be disturbed. The nearest significant site is Ward Spit, 5km to the east of the proposed desalination plant. Potential indirect impacts on breeding colonies of cormorants, terns and waders are unlikely to occur as the results of the hydrodynamic modelling suggest that the ecological effects of the brine discharge on marine biota would not be detectable at the closest sensitive sites (see Chapter 16, Marine Environment, for details).

### 04.4 REFERENCES

Baker, JL 2004, Towards a System of Ecologically Representative Marine Protected Areas in South Australian Marine Bioregions – *Technical Report, report to Coast and Marine Conservation Branch*, Department for Environment and Heritage, Adelaide.

Baxter, CI 2003, 'Banded Stilt *Cladorhynchus leucocephalus* breeding at Lake Eyre North in year 2000', *South Australian Ornithologist*, vol. 34, pp. 33–56.

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Wilson, JR 2000, South Australia Wader Surveys, January and February 2000, Australasian Wader Studies Group, Melbourne, & South Australian Ornithological Association, Adelaide.

## Attachment O4.1 Maximum counts of waders at sites in Upper Spencer Gulf

Species	Port Davis	Point Jarrold	Weeroona Island/ Pt Pirie	Port Germein	Ward Point	Ward Spit	Yalata Harbour	Red Cliff Point	Point Patterson	Port Augusta Saltfields	Blanche Harbour/ Fitzgerald Bay	Whyalla Saltfields	False Bay	Whyalla	Eleven Mile Creek	TOTAL
Pied Oystercatcher	9	13	15	2	13	11	2	13	2			32	10	43	2	167 <sup>1</sup>
Sooty Oystercatcher	1	1				2		7	12					14	6	43 <sup>1</sup>
Masked Lapwing				2				5	2	7		5		7	2	30 <sup>1</sup>
Banded Lapwing								4								4 <sup>1</sup>
Grey Plover	54	140				40						131	94			459
Pacific Golden Plover								20								20
Red-kneed Dotterel								1				1				2 <sup>1</sup>
Hooded Plover										1						1 <sup>1</sup>
Lesser Sand Plover		4														4
Greater Sand Plover												7				7
Oriental Plover																0
Red-capped Plover	50	30	1	309		200		460		22		254	2	23	260	1,611 <sup>1</sup>
Black-winged Stilt								1		30		22				53 <sup>1</sup>
Banded Stilt	450	20	60					183		5,000		2,630	500		6	8,849 <sup>1</sup>
Red-necked Avocet										166		35				201 <sup>1</sup>
Ruddy Turnstone		1				150						2				153
Eastern Curlew	1	32			3			5				3	3	1		48
Whimbrel																0
Grey-tailed Tattler		4														4
Common Sandpiper												3	2		2	7
Common Greenshank	9	15	46			25	56	25	55	6	85	63	42	78	42	547
Marsh Sandpiper	23											1				24
Bar-tailed Godwit	70	120				70						38	23			321
Black-tailed Godwit										1						1
Red Knot	280	1,800				4,000						300				6,380
Great Knot						80										80

## Attachment O4.1 Maximum counts of waders at sites in Upper Spencer Gulf (cont'd)

Species	Port Davis	Point Jarrold	Weeroona Island/ Pt Pirie	Port Germein	Ward Point	Ward Spit	Yalata Harbour	Red Cliff Point	Point Patterson	Port Augusta Saltfields	Blanche Harbour/ Fitzgerald Bay	Whyalla Saltfields	False Bay	Whyalla	Eleven Mile Creek	TOTAL
Knot sp.													2,000			2,000
Sharp-tailed Sandpiper	500	53		12		30				139		182	860	40	153	1,969
Curlew Sandpiper	21	99				48		6		727		676	1,014			2,591
Red-necked Stint	1,000	2,100		108		500		2,100		893						6,701
Sanderling																0
Unidentified medium wader									30					4		34
Unidentified small wader							713	500			20			200		1,433
<b>TOTAL</b>	<b>2,468</b>	<b>4,432</b>	<b>122</b>	<b>433</b>	<b>16</b>	<b>5,156</b>	<b>771</b>	<b>3,330</b>	<b>101</b>	<b>6,992</b>	<b>105</b>	<b>4,385</b>	<b>4,550</b>	<b>410</b>	<b>473</b>	<b>33,744</b>

<sup>1</sup> Non-migratory species.



Attachment O4.2 Estimated size and relative size of waterbird breeding colonies in Upper Spencer Gulf (data from Copley 1996)

Species	Estimated total breeding pairs in study area	Total in SA	Total in study area (percentage)
Pied Cormorant	3,260	10,000	33
Crested Tern	1,500	33,000	5
Caspian Tern	100	1,400	7
Fairy Tern	330	1,700	20
Silver Gull	500	70,000	1

Attachment O4.3 Waterbirds occurring in Upper Spencer Gulf

Scientific name	Common name	Conservation status*			Description^		
		Itnl	Aust	SA	Occurrence	Abundance	Wader
<i>Actitis hypoleucos</i>	Common Sandpiper	C, J, B	Ma, Mi <sup>1</sup>		Sum	U	Yes
<i>Anas castanea</i>	Chestnut Teal				Res	U	
<i>Anas gracilis</i>	Grey Teal				Res	C	
<i>Anas superciliosa</i>	Pacific Black Duck				Irr	U	
<i>Ardea alba</i>	Great Egret	C, J	Ma, Mi <sup>2</sup>		Res	U	
<i>Arenaria interpres</i>	Ruddy Turnstone	C, J, B	Ma, Mi		Sum	U	Yes
<i>Biziura lobata</i>	Musk Duck		Ma	R	Win	R	
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	C, J, B	Ma, Mi		Sum	C	Yes
<i>Calidris canutus</i>	Red Knot	C, J, B	Ma, Mi		Sum	U	Yes
<i>Calidris ferruginea</i>	Curlew Sandpiper	C, J, B	Ma, Mi		Sum	C	Yes
<i>Calidris ruficollis</i>	Red-necked Stint	C, J, B	Ma, Mi		Sum	C	Yes
<i>Calidris tenuirostris</i>	Great Knot	C, J, B	Ma, Mi		Sum	U	Yes
<i>Charadrius bicinctus</i>	Double-banded Plover		Ma		Win	R	Yes
<i>Charadrius leschenaultii</i>	Greater Sand Plover	C, J, B	Mi		Sum	R	Yes
<i>Charadrius mongolus</i>	Lesser Sand Plover	C, J, B	Mi		Sum	R	Yes
<i>Charadrius ruficapillus</i>	Red-capped Plover		Ma		Sum	C	Yes
<i>Chlidonias hybridus</i>	Whiskered Tern		Ma		Irr	U	
<i>Cladorhynchus leucocephalus</i>	Banded Stilt				Irr	C	Yes
<i>Cygnus atratus</i>	Black Swan				Irr	U	
<i>Egretta garzetta</i>	Little Egret		Ma		Res	R	
<i>Egretta novaehollandiae</i>	White-faced Heron				Res	C	
<i>Erythrocyne cinctus</i>	Red-kneed Dotterel				Irr	R	Yes
<i>Eudyptula minor</i>	Little Penguin		Ma		Irr	U	
<i>Fulica atra</i>	Eurasian Coot				Irr	U	
<i>Gallinula ventralis</i>	Black-tailed Native-hen				Irr	U	
<i>Haematopus fuliginosus</i>	Sooty Oystercatcher				Res	C	Yes
<i>Haematopus longirostris</i>	Pied Oystercatcher				Res	C	Yes
<i>Haliaeetus leucogaster</i>	White-bellied Sea-eagle	C	Ma, Mi	V	Irr	R	
<i>Heteroscelus brevipes</i>	Grey-tailed Tattler	C, J, B	Ma		Sum	R	Yes
<i>Himantopus himantopus</i>	Black-winged Stilt		Ma		Res	U	Yes
<i>Larus novaehollandiae</i>	Silver Gull		Ma		Res	C	
<i>Larus pacificus</i>	Pacific Gull		Ma		Res	U	
<i>Limosa lapponica</i>	Bar-tailed Godwit	C, J, B	Ma, Mi		Sum	U	Yes
<i>Limosa limosa</i>	Black-tailed Godwit	C, J, B	Ma, Mi		Sum	R	Yes
<i>Macronectes giganteus</i>	Southern Giant-Petrel		E, Ma		Win	R	
<i>Malacorhynchus membranaceus</i>	Pink-eared Duck				Irr	R	
<i>Morus serrator</i>	Australasian Gannet		Ma		Win	U	
<i>Numenius madagascariensis</i>	Eastern Curlew	C, J, B	Ma, Mi	V	Sum	R	Yes
<i>Numenius phaeopus</i>	Whimbrel	C, J, B	Ma, Mi		Sum	R	Yes

Attachment O4.3 Waterbirds occurring in Upper Spencer Gulf (cont'd)

Scientific name	Common name	Conservation status*			Description^		
		Intl	Aust	SA	Occurrence	Abundance	Wader
<i>Nycticorax caledonicus</i>	Nankeen Night Heron		Ma		Res	R	
<i>Pandion haliaetus</i>	Osprey	B	Ma, Mi	R	Irr	R	
<i>Pelecanus conspicillatus</i>	Australian Pelican		Ma		Irr	C	
<i>Phalacrocorax melanoleucos</i>	Little Pied Cormorant				Res	C	
<i>Phalacrocorax varius</i>	Pied Cormorant				Res	C	
<i>Phalaropus lobatus</i>	Red-necked Phalarope	C, J, B	Ma, Mi		Sum	R	Yes
<i>Philomachus pugnax</i>	Ruff	C, J, B	Ma, Mi		Sum	R	Yes
<i>Platalea regia</i>	Royal Spoonbill				Irr	R	
<i>Pluvialis fulva</i>	Pacific Golden Plover	C, J, B	Ma		Sum	R	Yes
<i>Pluvialis squatarola</i>	Grey Plover	C, J, B	Ma, Mi		Sum	U	Yes
<i>Poliocephalus poliocephalus</i>	Hoary-headed Grebe				Win	U	
<i>Porzana fluminea</i>	Australian Spotted Crake				Irr	R	
<i>Puffinus carneipes</i>	Flesh-footed Shearwater	J	Ma, Mi	R	Sum	R	
<i>Puffinus gavia</i>	Fluttering Shearwater		Ma		Win	R	
<i>Puffinus tenuirostris</i>	Short-tailed Shearwater	J	Ma, Mi		Win	U	
<i>Recurvirostra novaehollandiae</i>	Red-necked Avocet		Ma		Irr	U	Yes
<i>Stercorarius parasiticus</i>	Arctic Jaeger	J	Ma, Mi		Win	R	
<i>Sterna albifrons</i>	Little Tern	C, J	Ma, Mi	V	Sum?	R	
<i>Sterna bergii</i>	Crested Tern	C, J	Ma		Res	U	
<i>Sterna caspia</i> <sup>3</sup>	Caspian Tern	C	Ma, Mi		Res	C	
<i>Sterna nereis</i>	Fairy Tern		Ma	V	Res	R	
<i>Sterna nilotica</i>	Gull-billed Tern				Irr	R	
<i>Tadorna tadornoides</i>	Australian Shelduck				Irr	R	
<i>Threskiornis molucca</i>	Australian White Ibis		Ma		Irr	U	
<i>Tringa nebularia</i>	Common Greenshank	C, J, B	Ma, Mi		Sum	U	Yes
<i>Tringa stagnatilis</i>	Marsh Sandpiper	C, J, B	Ma, Mi		Sum	R	Yes
<i>Vanellus miles</i>	Masked Lapwing				Res	U	Yes
<i>Vanellus tricolor</i>	Banded Lapwing				Irr	U	Yes
<i>Xenus cinereus</i>	Terek Sandpiper	C, J, B	Ma, Mi		Sum	R	Yes

<sup>1</sup> Listed as *Tringa hypoleucos*

<sup>2</sup> Listed as *Egretta alba*

<sup>3</sup> Also known as *Hydroprogne caspia*

\*Conservation Status: letters under column Intl = international agreements on migratory species (J = Japan/Australia Migratory Birds Agreement, C = Japan/Australia Migratory Birds Agreement, B = Bonn Convention on the Conservation of Migratory Species of Wild Animals), column Aust = the category of listing under the *Environment Protection and Biodiversity Conservation Act 1999* (E = Endangered, Mi = listed migratory species, Ma = listed marine species) and under column SA = the category of threat listed under the *South Australian National Parks and Wildlife Act 1972* (V = Vulnerable, R = Rare).

^Description; Occurrence = likely status in study area: Sum = mainly spring–summer migrant (lesser numbers over winter); Res = resident (presumed to breed locally); Irr = irregular visitor (may occasionally breed locally); Win = mainly winter visitor. Abundance = abundance in study area: R = rare (usually small numbers only); U = uncommon; C = common (usually present in reasonable numbers). Note vagrant species are excluded from the list: Wader = waterbirds usually described as waders (migratory and non-migratory).

Attachment O4.4 Waterbirds listed as potentially occurring in Upper Spencer Gulf

Scientific name	Common name	Conservation status – Aust*	Notes
<i>Apus pacificus</i>	Fork-tailed Swift	Ma, Mi	Migratory species from SE Asia that occurs in SA mostly from October–April. It is entirely aerial when in SA (i.e. doesn't roost), but can fly low. Large flocks occur occasionally (up to 100,000s) in the Port Augusta area.
<i>Ardea ibis</i>	Cattle Egret	Ma, Mi	Occurs as a vagrant to the Port Augusta area.
<i>Calidris alba</i>	Sanderling	Ma, Mi	Migratory shorebird that occurs in SA mostly from Sept–April. No records are known from Upper Spencer Gulf. The nearest reports are from sandy beaches south of Cowell and Wallaroo.
<i>Charadrius veredus</i>	Oriental Plover, Oriental Dotterel	Ma, Mi	Migratory shorebird that occurs in SA mostly from Sept–April, with most reports from claypans, ploughed fields or (on hot days) adjacent tidal flats. No known records near Port Augusta/Whyalla.
<i>Diomedea gibsoni</i>	Gibson's Albatross	V, Ma, Mi	Oceanic species that has recently been split as a new species from the Wandering Albatross. It breeds in NZ and is occasionally recorded off eastern Australia. No known reports from Spencer Gulf.
<i>Gallinago hardwickii</i>	Latham's Snipe, Japanese Snipe	Ma, Mi	Migratory shorebird that occurs in SA mostly from Sept–April. It occurs in freshwater habitats and could possibly occur occasionally at sewage works/artificial freshwater lakes at Port Augusta and Whyalla.
<i>Hirundapus caudacutus</i>	White-throated Needletail	Ma, Mi	Migratory species from SE Asia that occurs in SA mostly October to April. It is entirely aerial when in SA (i.e. doesn't roost, but can fly low). No known records from the Spencer Gulf area.
<i>Macronectes halli</i>	Northern Giant-Petrel	V, Ma, Mi	Oceanic seabird that occurs in low numbers in the coastal waters of SA, mostly during winter. No records are known from Upper Spencer Gulf but it may occur in low numbers. The shallow waters of Upper Spencer Gulf are generally unsuitable as a habitat for oceanic seabirds (including the oceanic species listed below) because such habitats lack suitable food resources.
<i>Merops ornatus</i>	Rainbow Bee-eater	Ma, Mi	Breeds in Australia in spring–summer and migrates to northern Australia and SE Asia in winter. It is common in some years in sandy habitats in Upper Spencer Gulf.
<i>Thalassarche bulleri</i>	Buller's Albatross	V, Ma, Mi	Oceanic species occasionally recorded off SA. No known reports from Spencer Gulf.
<i>Thalassarche cauta</i>	Shy Albatross	V, Ma, Mi	Oceanic species regularly recorded off SA, mostly in winter. Small numbers are likely to occur in Upper Spencer Gulf.
<i>Thalassarche impavida</i>	Campbell Albatross	V, Ma, Mi	Oceanic species occasionally recorded off SA. No known reports from Spencer Gulf.

\*Conservation Status: Aust = the category of listing under the *Environment Protection and Biodiversity Conservation Act 1999* (V = Vulnerable, Mi = listed migratory species, Ma = listed marine species).

