

SHORT NOTE

Marine and coastal bird survey of islands in the Southern Lagoon, New Caledonia

MARLEEN BALING*
DIANNE H BRUNTON

Institute of Natural Resources, Massey University (Albany Campus), Private Bag 102-904, North Shore Mail Centre, Auckland, New Zealand

DARRYL JEFFRIES

School of Biological Sciences, University of Auckland, Private Bag 92019, Auckland, New Zealand

The Southern Lagoon (22°18'S to 23°S) is situated off the southern part of Grande Terre, New Caledonia. The lagoon contains >70 islands, which vary from unvegetated, flat islets of white sand, to raised, rocky, and forested islands (Bretagnolle & Benoit 1997; Benoit & Bretagnolle 2002). The islands support many bird species, including several endemic subspecies (Delacour 1966; Hannecart 1988) and are also used for fishing and recreation by people (Robinet *et al.* 1997). Most marine bird surveys of New Caledonia have been conducted during the southern summer (Dec-Mar) breeding season (Bretagnolle & Benoit 1997; Robinet *et al.* 1997; Benoit & Bretagnolle 2002). Here, we present information on species present in the Southern Lagoon in Sep 2004. The survey was conducted during a search for breeding fairy terns (*Sterna nereis*) and covered c.25% of the lagoon's area. We visited 15 islands and 8 coral banks within 8 days; census times on each island varied between 5 min and 4 h. We landed on 5 islands and 1 coral bank; the remainder were surveyed from a boat. Most islands were visited once, but 2 islands were visited twice and 4x, respectively. All bird species sighted and identified were recorded at every visit.

A total of 13 bird species was identified during our survey, including 4 seabirds, 7 waterbirds, and 2 other species (Table 1). The most common species was the silver gull (*Larus novaehollandiae*), followed by crested tern (*Sterna bergii*), and black-naped tern (*S. sumatrana*). All marine species listed here have been recorded before in New Caledonia (Rancurel 1976; de Naurois & Rancurel 1978; Hannecart 1988;

Benoit & Bretagnolle 2002; Barré & Bachy 2003). We did not record 10 other seabird species recorded in the vicinity of our survey sites by de Naurois & Rancurel (1978), Benoit & Bretagnolle (2002), and Barré & Bachy (2003). These 10 species included the more common wedge-tailed shearwater (*Puffinus pacificus*) and the black noddy (*Anous minutus*). Although we could have missed these species as a result of our survey method, which focused on terns along the coast and coral banks during the day, some terns, including bridled tern (*Sterna anaethetus*), roseate tern (*S. dougalli*), and little tern (*S. albifrons*) were generally absent in Sep, probably because of the patterns of their migrations. They have not been recorded in the area of this survey before Sep (Bretagnolle & Benoit 1997; Barré & Bachy 2003). Additionally, some species, such as red-footed booby (*Sula sula*) and Tahiti petrel (*Pseudobulweria rostrata*), have been listed as rare or declining in numbers within the Lagoon (Benoit & Bretagnolle 2002), and so were less likely to be sighted.

In Sep 2004, silver gulls and fairy terns were observed breeding on some of the islands visited, but the crested and black-naped terns were not (Table 1). Both crested and black-naped terns breed between Dec and Feb (Benoit & Bretagnolle 2002). Silver gulls in New Caledonia have been recorded to breed between Jul and Oct (Hannecart & Letocart 1980) and fairy terns nesting from Sep to Dec (de Naurois & Rancurel 1978; Hannecart & Letocart 1983). The subspecies *S. n. exsul* of fairy tern is considered endemic to New Caledonia (Hannecart 1988) and its population is listed as being of national concern because of its low numbers (Benoit & Bretagnolle 2002). However, its numbers are slowly

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*Corresponding author: m.baling@gmail.com

Table 1 List of bird species present on each island and coral bank surveyed in the Southern Lagoon, New Caledonia 4-21 Sep 2004. D, distance (km) of each island from the mainland; Date, dates of census for each island in Sep 2004; species, 2-letter codes, see text, bottom of opposite page; P, adults present; B, nesting adults present.

Island	D	Date	LN	SB	SS	ES	PH	AI	TI	SN	PF	EN	LL	TS	PR	Total
Îles aux Canards	1.0	4	B				P	P	P					P		5
Îlots Tioré	3.8	19														0
Coral bank 1, East of Île Ouen	3.8	19		P		P			P							3
Coral bank 2, East of Île Ouen	5.8	19		P		P			P							3
Sèche Croissant	7.0	16	P		P	P		P								4
Îlot Kaé	7.6	8, 18, 19, 21	P	P	P					B						4
Îlot Tareti	9.2	18	P	P	P											3
Îlot Signal	10.0	11	B			P	P	P	P		P	P	P			8
Îlot Goélands	10.0	16	P					P			P				P	4
Île Larégnère	10.0	16	P		P	P										3
le Quatre Bancs du Nord	11.6	19, 21		P	P	P	P									4
Îlot Uo	13.8	18			P											1
Îlot Pumbo	14.4	18														0
Îlot Puemba	16.2	18														0
Îlot Noé	17.0	18	P													1
Île Mato	17.6	18	P	P												2
Île Amédée	18.6	8	P		P					P						3
Île Mbé	20.0	8	P				P									2
Îlot Ndi	20.0	18														0
Coral bank 1 between Île Mato and Île Lérouté	22.4	18	P	P												2
Coral bank 2 between Île Mato and Île Lérouté	22.6	18	P	P												2
Îlot Atire	24.2	8, 21	B	P			P			B						4
Coral bank South of Îlot Atire	24.8	8	P													1
Total			15	9	7	6	5	4	4	3	2	1	1	1	1	59

increasing (authors' *unpubl. data*) after being absent from the lagoon in 1993-1996 (Benoit & Bretagnolle 2002). At the end of our survey period, black-naped terns were exhibiting courtship behaviour within the 2 fairy tern colonies. Most of the waterbird species recorded (Table 1) are regular visitors or common residents to the area. The observations of bar-tailed godwits (*Limosa lapponica*) on Signal I coincided with the period of their southward migration (Gill *et al.* 2005).

The variation in structure, size, and vegetation of the islands in the Southern Lagoon, New Caledonia, may influence the distribution of bird species there, but human disturbances and presence of introduced predators such as rats (*Rattus rattus*) are likely to be even stronger influences. Other studies have found a trend of decreasing species diversity and abundance on islands close to the mainland and the possible effects of disturbance on the availability of nesting grounds (Garnett 1984; Hannecart 1988; Robinet *et al.* 1997; Benoit & Bretagnolle 2002), but we did not find any obvious evidence for this during our survey. A marine reserve has been established within the Southern Lagoon and also public access to some islands is restricted during the breeding seasons of marine birds. However, marine surveys and studies still emphasise the need for more information on seabird and waterbird breeding biology, including evaluation of their habitat and environmental requirements. Elucidating the general distribution and seasonal movement patterns will be the key to furthering bird conservation of this region. Our survey provides some additional information on the distribution of coastal and sea birds in the Southern Lagoon area of New Caledonia in the southern spring.

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Table 1 - continued. Species codes: LN, *Larus novehollandiae* (silver gull); SB, *Sterna bergii* (crested tern); SS, *Sterna sumatrana* (black-naped tern); ES, *Egretta sacra* (Pacific reef heron); PH, *Pandion haliaetus* (osprey); AI, *Arenaria interpres* (ruddy turnstone); TI, *Tringa incana* (wandering tattler); SN, *Sterna nereis* (fairy tern); PF, *Pluvialis fulva* (Pacific golden plover); EN, *Egretta novaehollandiae* (white-faced heron); LL, *Limosa lapponica* (bar-tailed godwit); TS, *Todirhamphus sanctus* (sacred kingfisher); PR, *Pachycephala rufiventris* (rufous whistler).