SEABIRDS RECORDED IN ALGOA BAY DURING TRIPS TO AND FROM ST CROIX ISLAND, SOUTH AFRICA

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INTRODUCTION

Most records of seabirds in Algoa Bay, eastern Cape, South Africa have been based on 'wrecks' (e.g. Batchelor 1981) or on the occurrence of seabirds on islands (Courtenay-Latimer & Gibson-Hill 1946, Rand 1963, Randall *et al.* 1981). During regular visits to St Croix Island the opportunity arose to monitor the occurrence and abundance of seabirds along the route.

STUDY AREA AND METHODS

St Croix Island (33 48S, 25 46E) is situated 20,5 km northeast of the harbour at Port Elizabeth (for map see Randall *et al.* 1981). The route taken to the island reached a maximum distance of 7 km from the shore. The first 8 km from the harbour is between 10 and 20 m in depth, thereafter depth varies between 20 and 30 m, except for the area between Brenton and St Croix Islands which is between 10 and 20 m. The substratum is composed of unconsolidated sediment (Bremner & du Plessis 1980). Mean sea surface temperatures in the bay vary between 16°C and 21°C (Maritime Weather Office Charts).

Between May 1976 and May 1978 systematic counts were made of all birds seen from one side of a ten metre fishing boat during 38 trips to and from St Croix Island. Trips were usually made between 06h30 and 09h00, depending on whether it was a trip to the island or a return trip from the island. The boat maintained an almost constant speed of 7 knots (approximately 12 km/h). The observation point was about 3 m above the water. Only sightings which could be easily discerned with the naked eye were scored. The greatest distance at which birds were scored was estimated to be about 300 m. Identifications were confirmed with binoculars. In the case of some species e.g. the Subantarctic Skua *Catharacta antarctica*, which had a tendency to follow the boat, individuals were recognized so as to avoid scoring them more than once.

By recording the time of the onset of each trip and its duration as well as the time of each sighting it was possible to fix subsequently where each sighting was made. The positions of birds were fixed in four 5-km units from the harbour to the

island.

From May 1978 to April 1982 trips were undertaken on a faster moving skiboat travelling at an average speed of about 40 km/h, from which counts could not reasonably be maintained. Records of species seen on these trips were kept and used to supplement the data derived from the counts for the seasonal occurrence of the species.

RESULTS AND DISCUSSION

A total of 19 species of seabirds was observed on trips to St Croix Island between 1976 and 1983 (Table 1). Of these, 17 species were recorded during the counts. It was not always possible to identify terns *Sterna* spp. to specific level so that they are loosely divided into 'small' terns and Swift Terns *S. bergii*. Jackass Penguins *Spheniscus demersus*, Cape Gannets *Sula capensis*, Kelp Gulls *Larus dominicanus* and Cape Cormorants *Phalacrocorax capensis* were recorded in all months (Table 1), but not on all trips.

Jackass Penguins were recorded on 37 (97 %) of the trips during which counts were made. The numbers counted varied between two and 219. The numbers present in mixed species associations (*sensu* Evans 1982) varied between two and about 175, and when the contribution of the associations to the totals are excluded then the maximum number recorded on a trip was 88. When the year was divided into four 3-month periods, the final quarter had the highest mean numbers, including or excluding associations (Table 2). Four of the six associations were also noted in this quarter. The increased numbers may be related to the annual moult which occurs during this period and is associated with an influx of penguins, particularly immatures, to the island (Randall 1983). If one excludes units where associations were recorded then numbers increase toward the island, but if the associations are included the maximum number is in the second unit.

Cape Gannets were recorded on 30 (79 %) of the trips on which counts were undertaken. The numbers recorded were extremely variable, ranging from one to *c.* 1 000. High numbers occurred when associations were encountered, as happened on five trips. When these trips are excluded the maximum number recorded on any trip was 144. Seasonally there appeared to be an increase in numbers in April and May (Table 2). At this time there was also an influx of juveniles into the area, almost certainly from nearby Bird Island (Randall *et al.* 1981) although they alone did not account for the increases observed. Gannets were recorded in all four units, but were most abundant in the second unit, if associations were excluded.

Kelp Gulls were recorded on 35 (92 %) of the trips. The numbers varied between one and 39. There was some evidence of seasonal trends with slightly higher numbers recorded in October in 1976

TABLE 1

SEASONAL OCCURRENCE OF SEABIRDS RECORDED BETWEEN PORT ELIZABETH HARBOUR AND ST CROIX ISLAND DURING 1976-1982

Species	Month J	F	M	A	M	J	J	A	S	O	N	D
Jackass Penguin	x	x	x	x	x	x	x	x	x	x	x	x
Cape Gannet	x	x	x	x	x	x	x	x	x	x	x	x
Kelp Gull	x	x	x	x	x	x	x	x	x	x	x	x
Cape Cormorant	x	x	x	x	x	x	x	x	x	x	x	x
Whitebreasted Cormorant	x		x	x	x	x	x					x
Small terns *	x	x	x	x	x	x	x	x	x	x	x	x
Swift Tern			x	x	x	x	x	x				x
Subantarctic Skua			x	x	x	x	x	x	x	x		
Arctic Skua	x	x	x	x	x	x		x		x	x	x
Sooty Shearwater			x	x								
Cory's Shearwater		x										
Stormpetrel (cf. Wilson's)	x		x	x	x	x						x
Whitechinned Petrel				x						x		
Yellownosed Albatross		x						x				
Prion sp.								x				

* Common Tern, Arctic Tern, Antarctic Tern, Roseate Tern, Sandwich Tern

TABLE 2

NUMBERS AND DISTRIBUTION OF BIRDS SEEN ON TRIPS TO AND FROM ST CROIX ISLAND. THE DISTANCE IS DIVIDED INTO FOUR 5 KM UNITS
A = ASSOCIATIONS T = TOTAL

Species	Unit	T	T-A	Jan-Mar $\bar{x}$	Jan-Mar $\bar{x}$-A	April-June $\bar{x}$	April-June $\bar{x}$-A	July-Sept $\bar{x}$	July-Sept $\bar{x}$-A	Oct-Dec $\bar{x}$	Oct-Dec $\bar{x}$-A
Jackass Penguin *Spheniscus demersus*	1	80	53	1	1	1	1	4	2	4	3
	2	344	110	1	1	3	3	2	2	27	5
	3	277	247	8	8	5	5	1	1	13	13
	4	279	279	4	4	8	8	4	4	11	11
Cape Gannet *Sula capensis*	1	85	63	0	0	5	4	1	1	2	0
	2	240	194	1	1	11	11	3	3	7	3
	3	+1 329	116	2	2	21	6	3	3	93	1
	4	107	107	1	1	4	4	1	1	4	4
Kelp Gull *Larus dominicanus*	1	77	77	2	2	2	2	0	0	3	3
	2	67	67	1	1	1	1	1	1	4	4
	3	94	94	2	2	1	1	1	1	6	6
	4	107	107	4	4	1	1	2	2	4	4
Other species	1	344	263	1	1	7	3	17	13	15	13
	2	396	104	2	2	3	3	1	1	30	4
	3	270	82	1	1	2	2	1	1	21	4
	4	89	89	1	1	3	3	3	3	2	2

and 1977. Juvenile gulls were most commonly recorded in the counts made in March and April, but were occasionally recorded at other times of the year as well. Gulls were not observed at mixed species associations during the counts, although at other times they have been observed in associations. Gulls were recorded in all four units from the harbour to the island, with only a slight increase toward the island (Table 2). During the study period harbour modifications resulted in dredged bottom sediments being used as fill, which provided considerable amounts of food for gulls. Ships were also commonly anchored for several days outside the harbour, and the refuse dumped overboard served to attract gulls. Our route being roughly the shortest between the two points, was also that followed by the gulls. Gulls also regularly flew from the island to visit approaching boats which probably accounts for the increased numbers observed near St Croix Island. The higher numbers in the final quarter of the year were probably a reflection of the breeding season and in particular probably reflect adults on foraging trips for chick food.

Cape Cormorants were recorded on 17 (45 %) of the trips. The numbers recorded ranged from one to *c.* 100. Associations including Cape Cormorants were recorded on five trips and the number of cormorants at these associations varied from three to *c.* 100. Cape Cormorants were usually seen near the island or near the harbour, unless in associations which were recorded in the first three units.

Whitebreasted Cormorants *P. carbo* were observed in the months when breeding activity was most commonly recorded (Randall *et al.* 1981), with the exception of February. They were only recorded on 11 (29 %) of the counted trips. The numbers per trip were low, varying between one and 16. Whitebreasted Cormorants were not observed in associations. They were never observed foraging anywhere at sea except in the immediate vicinity of the island, where they tended to forage alone. Those observed from the boat were always flying, apparently on their way to the Swartkops River estuary and to inland waters.

The small terns included five species, viz. Common Tern *Sterna hirundo*, Arctic Tern *S. paradisaea*, Antarctic Tern *S. vittata*, Roseate Tern *S. dougallii* and Sandwich Tern *S. sandvicensis* . Small terns were present in all months (Table 1). Common, Arctic and Sandwich Terns were most abundant in summer, athough winter records of Sandwich Terns and Common Terns were not uncommon. Roseate and Antarctic Terns were restricted to the winter and spring months (late May to early October). The numbers of small terns recorded during counts varied from one to 121 and larger numbers were present in 1976 than 1977. This was largely due to six associations including terns in 1976. The largest number of small terns in an association during the counts was 60. Small terns were present in all four units, but were most frequently encountered nearer the harbour. Roseate Terns were only positively identified near the island.

Swift Terns breed in winter in Algoa Bay (Randall *et al.* 1981), and were chiefly recorded in autumn and winter (Table 1). They

were recorded on seven (18 %) of the trips when counts were made. Numbers ranged from one to five. They occasionally joined associations of small terns.

Subantarctic Skuas showed a markedly seasonal occurrence (Table 1). They arrived in late March and remained until late October, but were most abundant from April to September. Their numbers varied from one to 11. Like Kelp Gulls they were attracted to boats, probably exaggerating their actual abundance. They were not recorded in associations and were found in all four units.

Arctic Skuas *Stercorarius parasiticus* were seasonal in occurrence (Table 1). They arrived in October and usually remained until May, although there was one observation in June. Sightings were most common from October to April. Numbers were low, varying from one to four. Arctic Skuas were usually associated with small terns which they kleptoparasitized, and consequently were often present at associations when small terns were present.

Shearwaters were represented by two species, Sooty Shearwater *Puffinus griseus* and Cory's Shearwater *Calonectris diomedea* (Table 1). Sooty Shearwaters were recorded on two occasions during the counts with one individual on one occasion and three on the other. One Cory's Shearwater was seen.

Stormpetrels, tentatively identified as Wilson's Stormpetrel *Oceanites oceanicus*, were observed in several months (Table 1). They were only recorded on three trips during the counts and varied in number from one to 11.

Whitechinned Petrels *Procellaria aequinoctialis* were observed as single birds in two months (Table 1). One was recorded during counts.

Yellownosed Albatrosses *Diomedea chlororhynchos* were observed twice during the six years that trips to the island have been made (Table 1). None was recorded during the counts. A single prion *Pachyptila* sp. was observed during the period (Table 1), but not during the counts.

A sample of 43 associations was analysed and it was found that Jackass Penguins were present in 84 %, Cape Gannets 44 %, Cape Cormorants 56 %, terns 74 % and Kelp Gulls 16 % (Randall 1983). During the sampling period, associations were recorded chiefly in the latter part of 1976. However, subsequent recording (to the end of 1982) has shown that associations may occur in all months of the year in the bay. Associations had a large influence on the numbers of birds seen per trip. If an association was seen, even outside the area of the transect, higher than usual numbers of birds were recorded on the trip.

CONCLUSION

The numbers of birds recorded on the transects were low compared to the bird populations on islands in the bay (Randall *et al.* 1981). Presumably the majority forage farther out in the bay, or beyond, except during periods of localized food abundance. In trips to Bird Island and out of the bay both the numbers of birds seen and the species diversity increased markedly (R.M.R. unpubl. data). This was also demonstrated by records of seabirds sighted from a demersal trawler operating in eastern Cape waters (Liversidge & Le Gras 1981). Although the trawler seldom operated more than 40 km offshore, and generally operated within 5 km of the shore, there was a greater species diversity and a difference in the species composition recorded. The most noticeable differences related to the regular and frequent presence of albatrosses, Whitechinned Petrels and European Stormpetrels *Hydrobates pelagicus* (Liversidge & Le Gras 1981).

The great variation in species and bird numbers, both between years and even between trips in the same month (for example counts of 19 and 88 penguins were made in December 1976) suggests that food resources are patchily distributed in eastern Cape waters.

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