FLYING SEABIRDS OBSERVED OFFSHORE FROM POSSESSION ISLAND, CROZET ISLANDS, DURING WINTER 1996 AND 1997

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SUMMARY

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In March–November 1996 and April–September 1997, offshore bird observations at sea were carried out at sub-Antarctic Possession Island, Crozet Islands in the southern Indian Ocean. These observations give indications of the presence of birds around the island outside the austral summer period. Some summer-breeding species were absent or uncommon in winter. Winter-breeding and resident species remained common throughout the observation periods.

Keywords: Seabirds, sub-Antarctic, at-sea distribution

INTRODUCTION

Extensive studies have been conducted on the bird populations at islands in the sub-Antarctic region, particularly during the main summer breeding season. However, data on the presence of such birds out of the summer period are scarce because of the remoteness of these islands. Possession Island (46°25'S, 51°45'E) belongs to the Crozet Archipelago in the southern Indian Ocean, 2500 km from Africa and 1500 km from Antarctica. This archipelago is an important breeding area for seabirds, whose population is estimated to be up to 17 million birds (Jouventin 1994). We conducted at-sea bird observations at Possession Island outside the better-known summer period.

METHODS

This study was carried out during 1996 and 1997, outside the austral summer period. Offshore observations were made during periods of 15 minutes from the same point on the beach of La Baie du Marin at Possession Island using a 20× telescope. Only one observation was made a day. Observations occurred preferentially in the morning in 1996 and in the late afternoon in 1997. Table 1 shows the frequency of the observations per month, the number of days and total amount of time of observations per month. The sample size in parentheses in the text is the total number of flying birds observed during the 15-minute observation periods. Identification of birds was possible up to several kilometres, depending on species, sea and weather conditions. Flying birds (i.e. non-penguins) were counted irrespective of their direction of flight. We considered that the possibility of double counting was not of major significance, because the aim of the study was to obtain relative trends over time rather than real values.

RESULTS

Wandering Albatross *Diomedea exulans*

This species was common throughout the period of observation (Fig. 1). The numbers (1466) of birds observed decreased from an average of 15 individuals per 15 minutes in March to three individuals per 15 minutes in July. A slight increase occurred in August 1996 with five individuals per 15 minutes. However, it continued to decrease thereafter to a minimum of one per 15 minutes in November.

Black-browed Albatross *Thalassarche melanophrys*

Numbers (n = 62) were regular until April (one bird per 15 minutes, Fig. 2). The species was observed only once between 19 April and 20 August 1996, on 11 June. The return of birds was obvious from the beginning of September 1996. In 1997, no birds were observed between 11 April and 11 September.

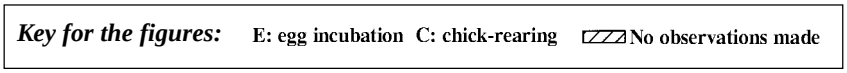
Grey-headed Albatross *Thalassarche chrysostoma*

This species was more frequently observed (n = 225, Fig. 3) than the Black-browed Albatross around Possession Island. The presence of these birds was regular until May (two birds per 15 minutes in April) and uncommon from June to August (six observations during both years in June and July). The species was again regular from the end of August. An obvious increase in observations occurred from October 1996 with an average of six birds per 15 minutes.

TABLE 1

Number of days and total amount of time of 15-minute periods of offshore observations per month

	1996								1997					
	Mar.	**Apr.**	**May**	**June**	**July**	**Aug.**	**Sep.**	**Nov.**	**Apr.**	**May**	**June**	**July**	**Aug.**	**Sep.**
No. of days of observation	22	16	13	13	12	20	18	18	19	16	13	6	14	14
Total time	12h20	5h30	3h40	3h50	7h30	7h40	5h40	4h30	4h45	4h	3h15	1h30	3h30	3h30



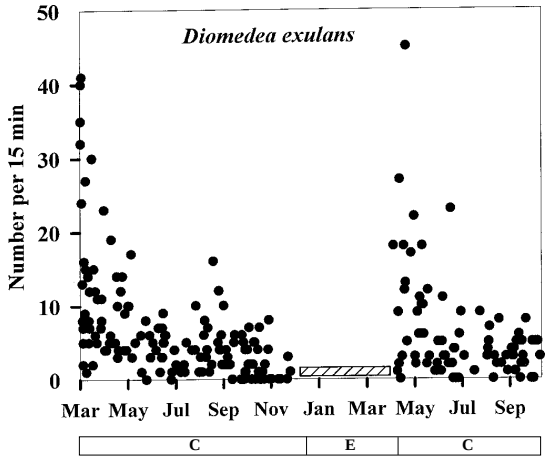


Fig. 1. Numbers of Wandering Albatrosses *Diomedea exulans* offshore from Possession Island outside summer 1996 and 1997. Breeding cycle from Voisin (1969) and Weimerskirch *et al.* (1986).

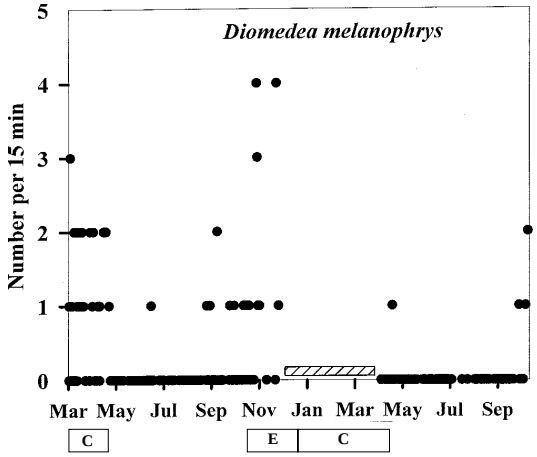


Fig. 2. Numbers of Black-browed Albatrosses *Thalassarche melanophrys* offshore from Possession Island outside summer 1996 and 1997. Breeding cycle from Weimerskirch *et al.* (1986).

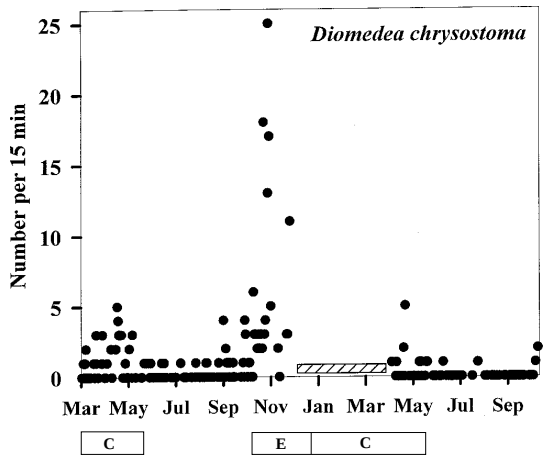


Fig. 3. Numbers of Grey-headed Albatrosses *Thalassarche chrysostoma* offshore from Possession Island outside summer 1996 and 1997. Breeding cycle from Weimerskirch *et al.* (1986).

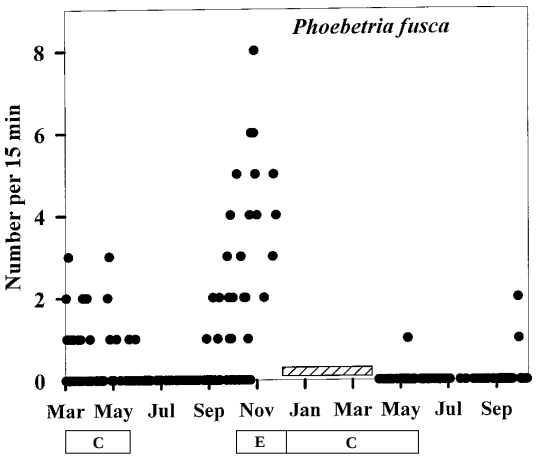


Fig. 4. Numbers of Sooty Albatrosses *Phoebetria fusca* offshore from Possession Island outside summer 1996 and 1997. Breeding cycle from Jouventin & Weimerskirch (1984) and Weimerskirch *et al.* (1986).

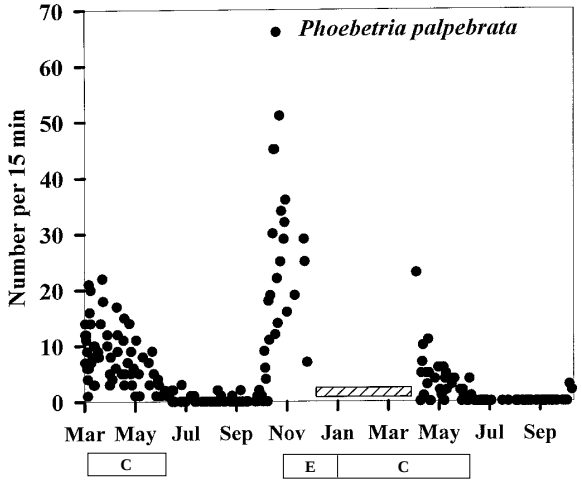


Fig. 5. Numbers of Light-mantled Albatrosses *Phoebetria palpebrata* offshore from Possession Island outside summer 1996 and 1997. Breeding cycle from Weimerskirch *et al.* (1986).

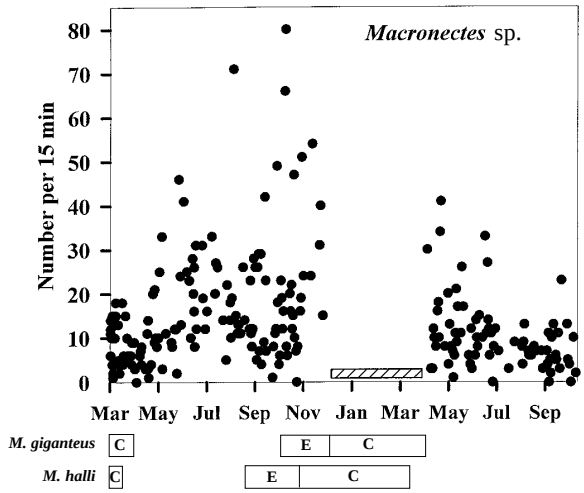


Fig. 6. Numbers of giant petrels *Macronectes* spp. offshore from Possession Island outside summer 1996 and 1997. Breeding cycles from Voisin (1968, 1976).

Indian Yellow-nosed Albatross *Thalassarche chlororhynchos*

This species was observed only rarely (n = 8) in the waters around Possession Island, even during the spring and the autumn, despite the fact that the species breeds in large numbers in the Crozet Islands (Jouventin 1994). It was not observed from May to September.

Sooty Albatross *Phoebetria fusca*

The Sooty Albatross was less frequently observed (n = 112, with a maximum of 0.6 birds per 15 minutes in March 1996, Fig. 4) than the Light-mantled Albatross. The species was not recorded from 26 May to 23 August in 1996 and from 3 May to 18 September in 1997.

Light-mantled Albatross *Phoebetria palpebrata*

The number of observations (n = 1308) decreased from an average of 10 per 15 minutes in March to one per 15 minutes in June 1996 (Fig. 5). In July and August, the species was observed seven times in 1996. In 1997, the last observation occurred on 1 June. The return of large numbers of birds occurred at the end of September, on 28 September 1996 and on 26 September 1997.

Giant petrels *Macronectes* spp.

It was not possible to differentiate between the two species of giant petrels when in flight at sea. The number of observations at sea (n = 3227) increased in winter (Fig. 6). From May to July averages of 20 and 13 birds per 15 minutes were observed, respectively, in 1996 and 1997. The numbers decreased from July to September. However, giant petrels were still common with 16 birds per 15 minutes in 1996 and eight birds per 15 minutes in 1997. To have an estimation of the proportion of Southern Giant Petrels *M. giganteus* and Northern Giant Petrels *M. halli*, we made an additional count onshore in a King Penguin *Aptenodytes patagonicus* colony using the bill colour to identify the species. The maximum number of giant petrels occurred in April with an average of 160 individuals present, 50% of each species. An average of 40 individuals frequented the colony daily from June to October. The numbers of Southern Giant Petrels were lower than those of Northern Giant Petrels during this period and decreased from April to October. Two Southern Giant Petrels of the white form frequented the penguin colony in 1996 and 1997.

Antarctic Fulmar *Fulmarus glacialoides*

This species comes from the Antarctic Continent and does not breed in the Crozet Islands (Jouventin 1994). Single birds were observed in 1996 on 10 and 11 June, 23 July and 6 August. On 30 July, three birds passed in 90 minutes. A significant influx occurred in the area in one week from 23 August to 2 September 1996. The maximum was on 24 August with 39 birds per 15 minutes. During this day, several hundred birds were simultaneously visible between Possession Island and Ile de Î'Est in small flocks of several dozen birds. Probably several thousand birds were present in the area. Single birds were observed until 17 October. In 1997, no birds were observed.

Pintado Petrel *Daption capense*

The species was common throughout the year (n = 1579, Fig. 7). In 1996, numbers increased from three to 10 birds per 15 minutes from April to July. The maximum was observed in October (18 birds per 15 minutes). The number was quite constant during the 1997 winter (six birds per 15 minutes). In 1996, the largest flocks were observed feeding on dead penguins, 35 individuals on 15 June, 30 individuals on 11 August and 40 individuals on 21 September.

Prions *Pachyptila* spp.

The identification of the different species of prions was almost impossible in the usual conditions of observation. Nevertheless, when birds were sufficiently close to allow their identification, we verified that birds were mostly Salvin's Prion *Pachyptila salvini*. It suggests that observations (n = 14 338, Fig. 8) were mainly of this species.

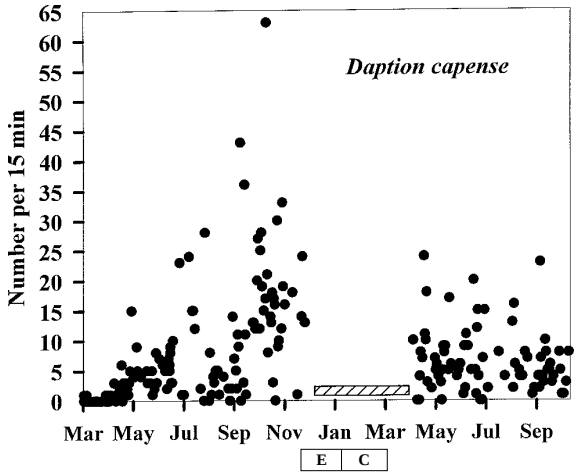


Fig. 7. Numbers of Pintado Petrels *Daption capense* offshore from Possession Island outside summer 1996 and 1997. Breeding cycle from Despin (1977).

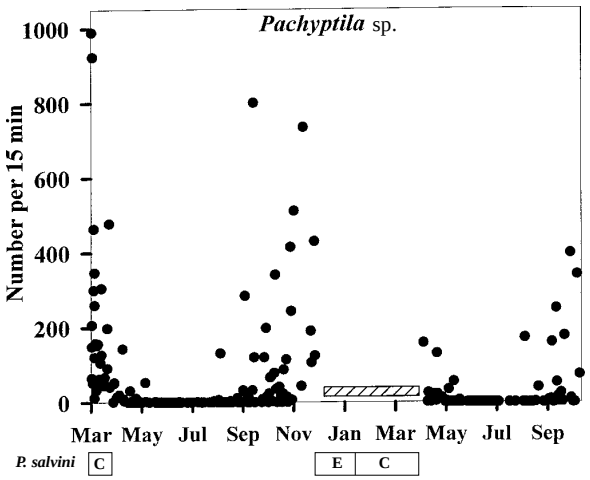


Fig. 8. Numbers of prions *Pachyptila* spp. offshore from Possession Island outside summer 1996 and 1997. Breeding cycle of Salvin's Prion *P. salvini* from Derenne & Mougin (1976) and Jouventin *et al.* (1985).

Prions were very abundant until March (197 per 15 minutes in 1996). The number greatly decreased from early April. A few observations were recorded between 2 May and 19 August in 1996 and from 21 May to 8 August in 1997. Birds returned massively from late August in both years. An influx (172 per 15 minutes) was noticed on 26 July 1997.

Thin-billed Prion *Pachyptila belcheri*

One bird was observed on 30 March 1996, several on 16 July and one on 28 August. In July, whereas very few prions were seen, several hundred appeared at sea on 30 July (131 in 15 minutes). All the birds identified were Thin-billed Prions and no Salvin's Prions were observed. They stayed in the area for a few days only.

Fairy Prion *Pachyptila turtur*

The Fairy Prion was uncommon (n = 10) compared with Salvin's Prion. Only 10 observations were recorded, six between 25 and 30 March 1996, one on 25 April and three on 16 July.

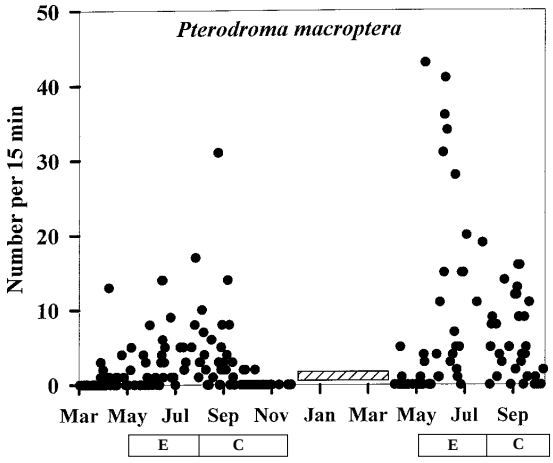


Fig. 9. Numbers of Great-winged Petrels *Pterodroma macroptera* offshore from Possession Island outside summer 1996 and 1997. Breeding cycle from Jouventin *et al.* (1988).

Blue Petrel *Halobaena caerulea*

The Blue Petrel was rarely observed during winter but the number of observations (22) might be underestimated due to the difficulty of separation at long distance from prions. Six birds were seen on 30 March 1996, two on 5 April, one on 21 May, one on 9 and 11 June, one on 16 July, eight in 45 minutes on 20 September and two on 2 October. No birds were seen in 1997.

Great-winged Petrel *Pterodroma macroptera*

This species breeds during winter. In 1996, the first observation occurred on 26 March 1996 and the last one on 4 October 1996 (Fig. 9). The number of records (844) was highest in July and August, with six and five birds per 15 min, respectively. In 1997 five birds per 15 minutes were counted on 4 April. The maximum number of birds recorded was in May and June with an average of 11 birds per 15 minutes. Numbers of nine per 15 minutes in July and August decreased to three per 15 minutes in September.

White-headed Petrel *Pterodroma lessoni*

This species which breeds in Possession Island (Barré 1976) was uncommon (n = 21) with only 16 observations in 1996, six in March, three in April, four in May and three in June. In 1997, one was seen in April, two in May and two in September. However, the number of observations could possibly have been underestimated because of the difficulty of identification compared with Soft-plumaged Petrels *P. mollis* at long distance.

Kerguelen Petrel *Pterodroma brevirostris*

This species was very abundant throughout winter (n = 1 982, Fig. 10). The number of birds was highest from April to June in 1996 (seven to six per 15 minutes) and May to July in 1997 (28 to 33 per 15 minutes). However, large numbers of birds were also

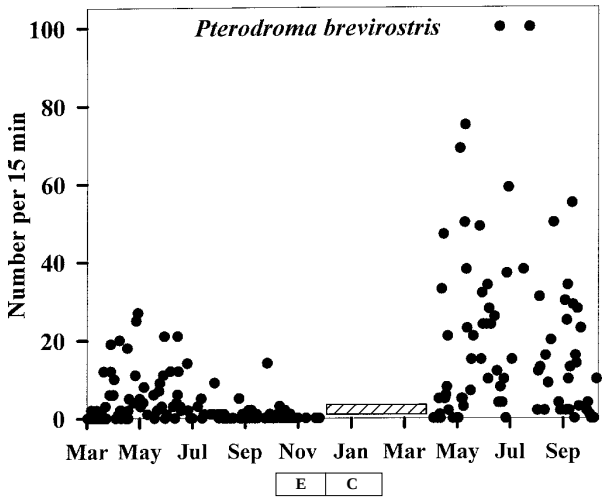


Fig. 10. Numbers of Kerguelen Petrels *Pterodroma brevirostris* offshore from Possession Island outside summer 1996 and 1997. Breeding cycle from Jouventin *et al.* (1988).

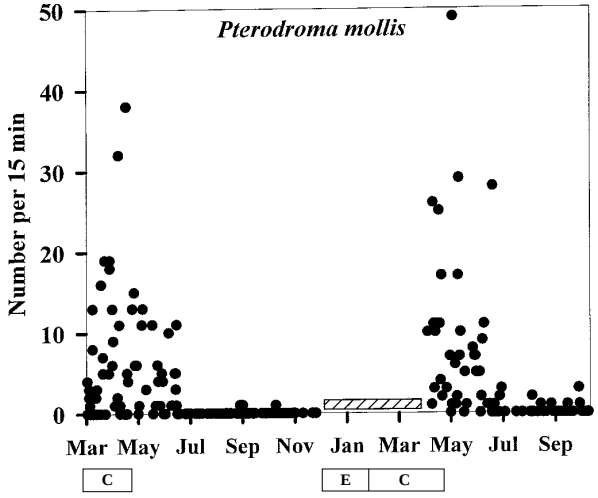


Fig. 11. Numbers of Soft-plumaged Petrels *Pterodroma mollis* offshore from Possession Island outside summer 1996 and 1997. Breeding cycle from Jouventin *et al.* (1988).

recorded from July to September in 1997. These results show great differences between both years.

Soft-plumaged Petrel *Pterodroma mollis*

The maximum number of observations was in April with eight birds per 15 minutes in 1996 and 10 per 15 minutes in 1997 (n = 757, Fig. 11). In 1996, the last observation occurred on 11 June and only isolated birds were seen on 23 and 26 August, and from 3 October until November. In 1997, the species was still common to mid-June. Only two birds were seen on 26 July, 5 August and 17 August and three observations of isolated birds occurred in September. The number of birds observed per month was very similar in both years. The small number of observations of this species from September to November may possibly be explained by its nocturnal habits.

White-chinned Petrel *Procellaria aequinoctialis*

The number of birds (n = 907, Fig. 12) was highest in March 1996 (13 per 15 minutes) but greatly decreased from April. This species was rare in May (0.4 per 15 minutes) and June (0.3 per 15 minutes), and absent in July and August 1996. Observations in 1997 follow the same pattern with one on 5 June, none in July and one on 26 August. In both years birds returned in late September.

Grey Petrel *Procellaria cinerea*

The first observation occurred on 15 March 1996. Grey Petrels were regular throughout the winter when this species breeds, but always in small numbers with a maximum of two birds per 15 minutes in June 1996(n = 93, Fig. 13). The last observations occurred in September.

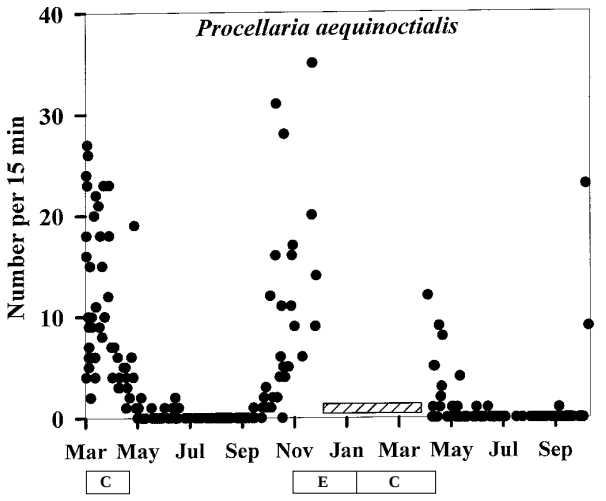


Fig. 12. Numbers of White-chinned Petrels *Procellaria aequinoctialis* offshore from Possession Island outside summer 1996 and 1997. Breeding cycle from Jouventin *et al.* (1985).

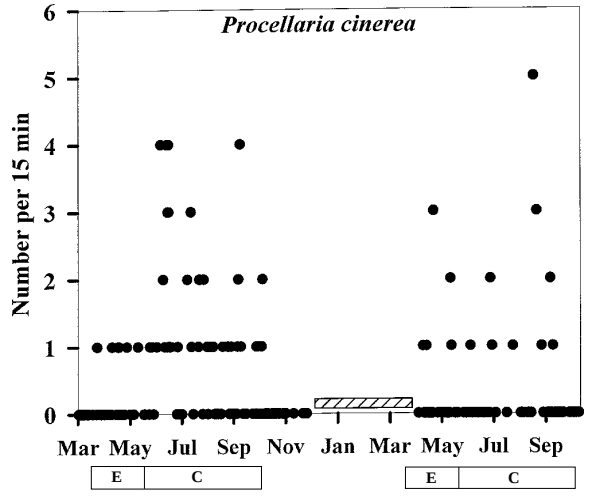


Fig. 13. Numbers of Grey Petrel *Procellaria cinerea* offshore from Possession Island outside summer 1996 and 1997. Breeding cycle from Barrat (1974) and Jouventin *et al.* (1985).

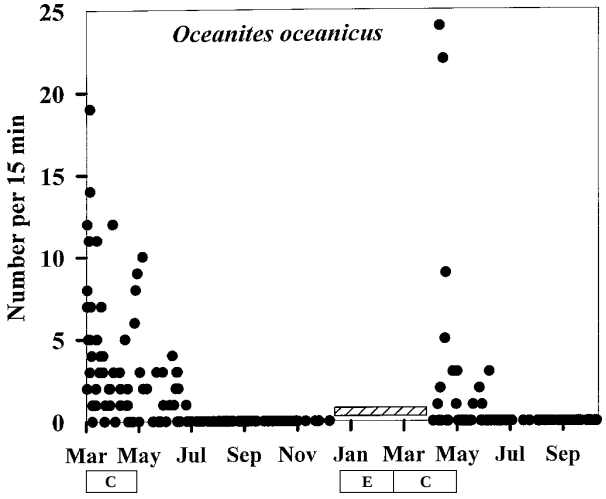


Fig. 14. Numbers of Wilson's Storm Petrel *Oceanites oceanicus* offshore from Possession Island outside summer 1996 and 1997. Breeding cycle from Jouventin *et al.* (1985, 1988).

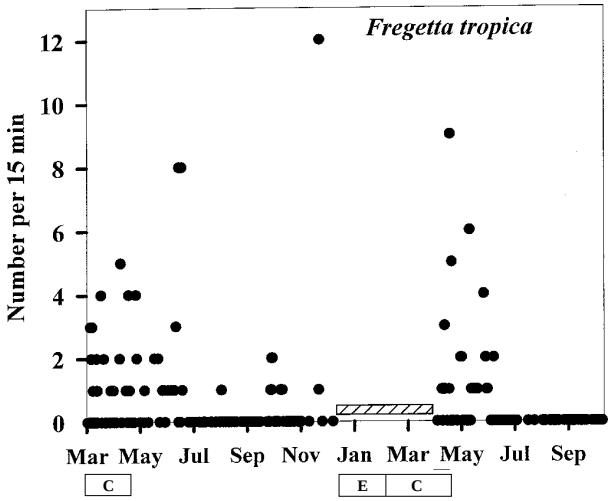


Fig. 15. Numbers of Black-bellied Storm Petrel *Fregetta tropica* offshore from Possession Island outside summer 1996 and 1997. Breeding cycle from Jouventin *et al. (*1988).

Little Shearwater *Puffinus assimilis*

The species may breed in the Crozet Islands (Stahl *et al.* 1984). The species was observed (n = 26) each month during the winter of 1996 with a maximum of 12 observations in March and five observations at the end of August. It was not observed in 1997.

Wilson's Storm Petrel *Oceanites oceanicus*

Several thousand pairs breed in the Crozet Islands (Jouventin 1994). The number of birds (n = 329, Fig. 14) observed decreased from March to June with an average of five individuals per 15 minutes in March. The last observations occurred on 21 June 1996 and 1 June 1997. Some birds were observed flying over land in April, May and June.

Black-bellied Storm Petrel *Fregetta tropica*

The numbers of birds (n = 139, Fig. 15) was constant from March to May with an average of one bird per 15 minutes. A flock of 36 individuals was observed on 29 April 1996 near the coast but not during a 15-minute count. The last observations occurred on 17 June 1996 and 1 June 1997. In 1996 one bird was observed on 28 July. The species was again regular from the end of September.

Diving petrels *Pelecanoides* spp.

It was not possible to differentiate Georgian *Pelecanoides georgicus* and Common *P. urinatrix* Diving Petrels when in flight at sea. The number of observations (n = 18 524) was high throughout the winter. They increased from March (17 birds per 15

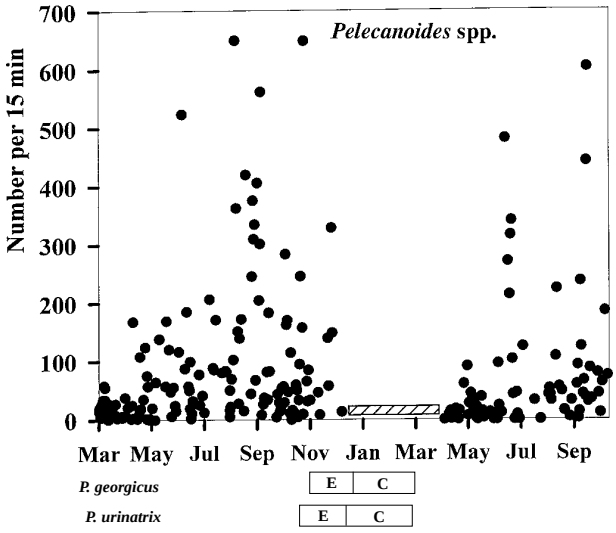


Fig. 16. Numbers of diving petrels *Pelecanoides* spp. offshore from Possession Island outside summer in 1996 and 1997. Breeding cycle from Jouventin *et al.* (1988).

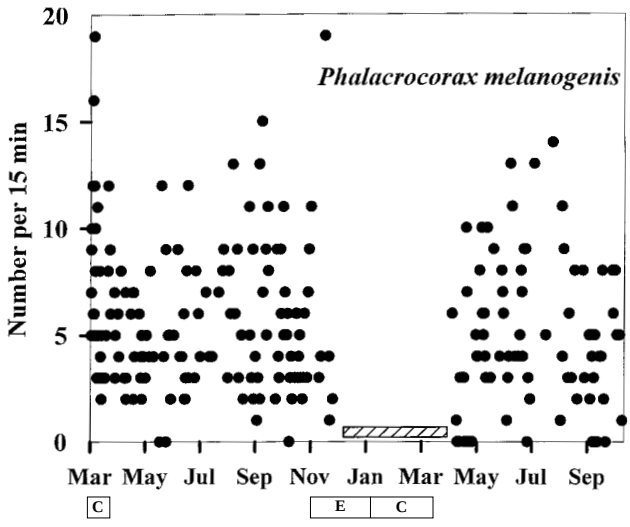


Fig. 17. Numbers of Crozet Cormorants *Phalacrocorax (atriceps) melanogenis* offshore from Possession Island outside summer 1996 and 1997. Breeding cycle from Derenne *et al.* (1976).

minutes) to a maximum in August in 1996 (250 birds per 15 minutes) and in June in 1997 (141 birds per 15 minutes). See Fig. 16.

Crozet Cormorant *Phalacrocorax (atriceps) melanogenis*

The number of observations (n = 1298, Fig. 17) remained constant through the winter with four to seven birds per 15 minutes. This is in accordance with the sedentary nature of this species.

Subantarctic Skua *Catharacta antarctica*

Few birds stayed at Possession Island during the winter. The birds frequenting the Alfred Faure Base during the 1996 winter varied from a maximum of seven in May, three in June, two in July, three in August and six in September. Between May and August 1996, one to five birds frequented a King Penguin colony of 20 000 pairs. The return of the breeding population was obvious from the first days of September 1996.

Kelp Gull *Larus dominicanus*

The species was observed through the year but not counted. Seven to 40 birds frequented the Alfred Faure Base between May and August.

Kerguelen Tern *Sterna virgata*

The number of observations (n = 2650, Fig. 18) remained constant through the winter from 1 to 3 birds per 15 min, which confirms the sedentary nature of this species.

Lesser Sheathbill *Chionis minor*

A flock of three birds was observed at sea several kilometres from the coast between Possession and Île de l'Est, suggesting exchanges of birds between the two islands 18 kilometres apart.

DISCUSSION

Several summer-breeding species (Black-browed, Grey-headed, Sooty and Light-mantled Albatrosses, Salvin's Prion, Soft-plumaged, White-headed and White-chinned Petrels and Subantarctic Skua) were absent or very uncommon from June to late August. This suggests that their whole populations migrate out of the area during this period. In 1997, Kerguelen Petrels were significantly more abundant and remained common in the area even after June. Conversely, Soft-plumaged Petrels was scarcely observed after June which suggests that they changed their foraging areas. Wandering Albatrosses and Great-winged and Grey Petrels rear their chicks during winter, which explains their presence throughout the observation period. However, Wandering Albatross showed fewer observations in winter compared to summer because of their then longer foraging trips at sea. Smaller species of albatrosses, whose breeding periods occur in summer, were uncommonly observed in the area during winter. Conversely, their numbers were highest during the mating period in October–November when birds spent much time flying near their breeding areas.

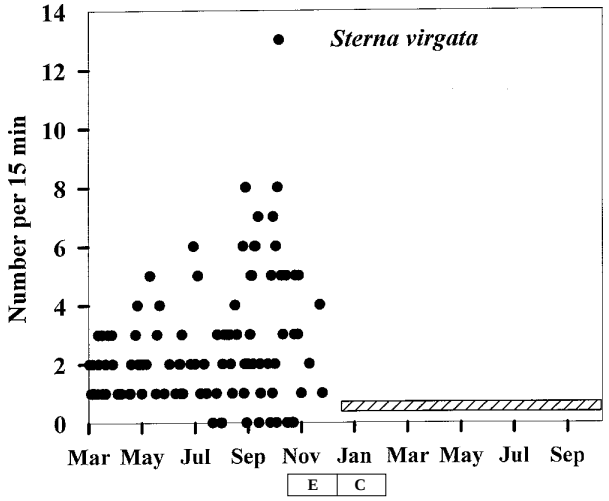


Fig. 18. Numbers of Kerguelen Tern *Sterna virgata* offshore from Possession Island outside summer 1996 and 1997. Breeding cycle from Stahl & Weimerskirch (1981).

Both species of giant petrels and diving petrels, Pintado Petrel, Crozet Cormorant, Kelp Gull and Kerguelen Tern were invariably present throughout the observation period even outside of their breeding seasons. Although some giant petrels migrate to the coast of South Africa during the winter, their numbers around Possession Island were the highest during this period. They largely frequented King Penguin colonies to prey upon chicks grouped in crèches.

Antarctic Fulmar and Thin-billed Prion were observed in large numbers of several hundred to several thousands of birds, but only on a few days. These observations suggest that these birds were erratic and that they probably concentrate in large flocks during the winter period. Lastly, no Grey-backed Storm Petrel *Garrodia nereis* was observed during the both years whereas this bird is known to be common around Crozet Islands in summer. The uncommon Antarctic Tern *Sterna vittata* was not observed.

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