

Bird ringing at Marion and Prince Edward Islands, 1982-1987; with an analysis of movements since 1951

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*Bird-ringing activities at Marion and Prince Edward Islands are summarized for the period June 1982 – July 1987. A total of 6 347 birds of 15 species was ringed during this period and 480 recoveries or recaptures were recorded from the islands. A further 25 birds are newly reported as recovered or recaptured elsewhere and 27 foreign-ringed birds are newly reported at Marion and Prince Edward Islands. An overall total of 107 individuals of seven species has been recorded moving from or to the Prince Edward Islands, of which wandering albatrosses *Diomedea exulans* constitute 46 per cent of the records. Interchange of young king penguins *Aptenodytes patagonicus* (mainly moulting birds), wandering albatrosses, southern giant petrels *Macronectes giganteus* and Subantarctic skuas *Catharacta antarctica* has occurred between the Prince Edward Islands and Iles Crozet, 1 068 km apart. However, breeding interchange has only been definitely proven for the wandering albatross. Other movement patterns are similar to those reported in the literature.*

*Voëlberingsaktiwiteite op Marion- en Prins Edward-eilande word vir die tydperk Junie 1982 tot Julie 1987 opgesom. 'n Totaal van 6 347 voëls van 15 spesies is gedurende dié tydperk gering en 480 opsporings of hervangste is op die eilande aangeteken. 'n Verdere 25 voëls is onlangs elders opgespoor of weer gevang en 27 voëls wat by ander terreine gering is, is onlangs by Marion- en Prins Edward-eiland aangeteken. 'n Totaal van 107 voëls van sewe spesies wat na of van die Prins Edward-eilande beweeg, is opgeteken, waarvan grootmalmokke *Diomedea exulans* 46 persent uitmaak. Uitruiing van jong koningspikkewyne *Aptenodytes patagonicus* (hoofsaaklik ververende voëls), grootmalmokke, reuse nellies *Macronectes giganteus* en bruinroofmeeue *Catharacta antarctica* het tussen die Prins Edward-eilande en Iles Crozet, wat 1 068 km uitmekaar geleë is, plaasgevind. Broei-uitruiing is egter slegs definitief by die grootmalmok bewys. Ander bewegingspatrone is soortgelyk aan dié waarvan voorheen in die literatuur melding gemaak is.*

Introduction

This paper covers bird-ringing activities at the sub-Antarctic Marion (46°52'S, 37°51'E) and Prince Edward (46°38'S, 38°00'E) Islands for the period June 1982 to July 1987 inclusive. The period 1951 to May 1982 has been previously covered by Berruti *et al.* (1975), Burger & Morant (1977) and Brown & Oatley (1982). Movements of ringed birds since 1951 from and to the Prince Edward Islands are analysed. A ringed bird found dead is defined as a recovery, a ringed bird found alive is defined as a recapture.

Results

Altogether 6 347 birds of 15 species were ringed during the period under review. This brings the total of birds ringed at

Marion and Prince Edward Islands since October 1951 to 12 424 individuals of 26 species (Table 1). Of these, 480 have been recovered or recaptured at Marion or Prince Edward Islands since June 1982 (Table 1) and a further 25 individuals have been recovered at other localities, including previously unpublished records (Table 2). The total numbers of Marion and Prince Edward-ringed birds recovered or recaptured since 1951 is now 777 at Marion and Prince Edward Islands themselves and 40 from other localities. This represents 6.6 per cent of the ringing effort.

Two schools of thought exist as to whether the broadbilled prion *Pachyptila vittata* and Salvin's prion *P. (v.) salvini* are full species or whether the latter is a sub-species of the former (Cox 1980, Harper 1980). Both authors agree that the taxon represented on Marion and Prince Edward Islands is the Salvin's prion and for uniformity the total for broadbilled prion in the previous report (Brown & Oatley 1982) has been incorporated into the total for Salvin's prion.

Recoveries of Marion Island wandering albatrosses *Diomedea exulans* were reported from Ile de la Possession, Crozets, and Australia (Table 2). Most of the 27 newly reported foreign-ringed birds at Marion originated from these areas (Table 3). A greyheaded albatross *D. chrysostoma* reached New Zealand. Three Subantarctic skua *Catharacta antarctica* recoveries were reported: two from the southwestern Cape, South Africa and one from the southeast coast of the Malagasy Republic (Table 2). Five newly reported king penguins *Aptenodytes patagonicus* recaptured at Marion originated from Ile de la Possession and the Australasian gannet *Sula serrator* previously reported (Brown & Oatley 1982) returned for a third year in October 1982 but was not recorded again after this date (Table 3).

Discussion

The period 1982-1987 has seen a large increase in the amount of ringing activity at Marion Island. Ringing activity at nearby Prince Edward Island is minimal due to the infrequency of visits to that island and totals, with very few exceptions, refer to Marion Island. Two wandering albatross long-term study areas were established at Marion Island in 1983-84 with a third in 1986-87. Most of the wandering albatross adults and chicks ringed and recaptured on the island were in these three study areas. This explains the increase in the number of wandering albatross recaptures: 259 in this period. During this period a project was completed on the two species of giant petrels *Macronectes* spp. and Subantarctic skuas at Marion Island with a large number of birds being ringed as part of this work (Table 1). These four species account for 84 per cent of all the birds ringed and 88 per cent of all recoveries and recaptures for the period 1982-1987.

To date, 107 ringed birds of seven species have been recorded moving from or to the Prince Edward Islands (Table

Table 1

Birds ringed and recovered or recaptured at Marion and Prince Edward Islands between June 1982 and July 1987, with grand totals of all birds ringed and recovered or recaptured since October 1951

Species	Jun 1982-Jul 1987			Oct 1951-Jul 1987	No. of birds recovered or recaptured prior to Jun 1982	No. of birds recovered or recaptured, Jun 1982-Jul 1987 ^a	Total recovered or recaptured, 1951-1987
	Nestling	Full grown	Total	Grand Total			
Rockhopper penguin <i>Eudyptes chrysocome</i>	-	-	-	76	9	-	9
Macaroni penguin <i>Eudyptes chrysolophus</i>	-	-	-	54	17	2	19
King penguin <i>Aptenodytes patagonicus</i>	-	163	163	173	2	2	4
Wandering albatross <i>Diomedea exulans</i>	1 325	513	1 838	4 020	84	259 ^b	343
Greyheaded albatross <i>Diomedea chrysostoma</i>	224	-	224	427	-	-	-
Yellownosed albatross <i>Diomedea chlororhynchus</i>	-	-	-	271	-	6	6
Sooty albatross <i>Phoebastria fusca</i>	-	-	-	422	45	1	46
Lightmantled sooty albatross <i>Phoebastria palpebrata</i>	-	-	-	29	2	-	2
Southern giant petrel <i>Macronectes giganteus</i>	1 133	847	1 980	2 052	1	82 ^c	83
Northern giant petrel <i>Macronectes halli</i>	292	478	770	844	6	66 ^d	72
Giant petrels <i>Macronectes</i> sp.	-	-	-	301	19	-	19
Greatwinged petrel <i>Pterodroma macroptera</i>	11	-	11	95	-	3	3
Softplumaged petrel <i>Pterodroma mollis</i>	-	-	-	82	-	-	-
Kerguelen petrel <i>Pterodroma brevirostris</i>	-	13	13	179	1	1	2
Whiteheaded petrel <i>Pterodroma lessoni</i>	-	-	-	1	-	-	-
Blue petrel <i>Halobaena caerulea</i>	47	284	331	395	-	1	1
Salvin's prion <i>Pachyptila (v.) salvini</i>	-	27	27	649	-	-	-
Fairy prion <i>Pachyptila turtur</i>	-	1	1	61	-	-	-
Whitechinned petrel <i>Procellaria aequinoctialis</i>	12	75	87	363	7	34 ^e	41
Grey petrel <i>Procellaria cinerea</i>	-	18	18	31	-	-	-
Common diving petrel <i>Pelecanoides urinatrix</i>	-	-	-	41	-	-	-
South Georgian diving petrel <i>Pelecanoides georgicus</i>	-	-	-	53	-	-	-
Kelp gull <i>Larus dominicanus</i>	31	10	41	59	2	-	2
Subantarctic skua <i>Catharacta antarctica</i>	574	190	764	1 088	9	14	23
Lesser sheathbill <i>Chionis minor</i>	-	-	-	569 ^f	93	8	101
Imperial cormorant <i>Phalacrocorax atriceps</i>	-	79	79	89	-	1	1
Totals	3 649	2 698	6 347	12 424 ^g	297	480	777

^a - Excludes ringed study birds handled regularly in the field.

^b - Includes 62 birds captured on two or more occasions during the relevant period.

^c - Includes six birds captured twice during the relevant period.

^d - Includes five birds captured on two or more occasions during the relevant period.

^e - Includes two birds captured twice during the relevant period.

^f - Total of 690 in Brown & Oatley (1982) is incorrect, amended figure given here.

^g - Total of 6 048 in Brown & Oatley (1982) is incorrect, amended figure added to this period's total.

Table 2
Birds ringed at Marion Island and recovered or recaptured at other localities, June 1982 – July 1987,
including earlier records previously unreported

Species, ring number and age at ringing	Date ringed	Locality, date recovered or recaptured, and status	Displacement*
Wandering albatross			
578-00574, nestling	16.09.65	At sea, off Great Australian Bight, 34°00'S, 126°40'E, 28.5.68. Status unknown.	7 253 km
J01104, nestling	25.10.78	Ile de la Possession, Crozets, 46°25'S, 51°45'E, March 1984. Recaptured.	1 068 km
J01425, nestling	24.04.79	Ile de la Possession, Crozets, 46°25'S, 51°45'E, March 1984 & 09.01.86. Recaptured. ^b	1 068 km
J01523, nestling	24.04.79	Ile de la Possession, Crozets, 46°25'S, 51°45'E, March 1984. Recaptured.	1 068 km
J03659, nestling	30.10.84	Tasman Sea, 39°46'S, 167°58'E, 13.08.87. Entangled in fishing line, released.	9 190 km
J03700, nestling	30.10.84	Peterborough, Australia, 38°35'S, 142°56'E, 24.04.85. Found dead.	7 962 km
Greyheaded Albatross			
8-45237, nestling	25.04.87	Whatipu Beach, North Island, New Zealand, 37°01'S, 174°29'E, 20.07.87. Found dead.	9 737 km
Southern giant petrel			
578-00976, nestling	24.02.66	Ile Aux Cochons, Crozets, 46°06'S, 50°15'E, 22.11.74. Recaptured.	960 km
9-52005, nestling	22.02.84	Macquarie Island, 54°34'S, 158°56'E, 20.05.84. Found dead.	7 456 km
9-52203, nestling	22.02.84	Kabara Island, Fiji, 18°57'S, 178°58'W, 25.06.84. Found dead. ^c	11 821 km
9-52270, nestling	24.02.84	Cape Peron, Australia, 32°16'S, 115°41'E, 15.07.84. Found dead.	6 593 km
9-57533, nestling	24.01.85	Port Lincoln, Australia, 34°44'S, 135°52'E, 04.07.85. Found weak, released.	7 819 km
9-58360, nestling	15.02.85	Coronel, Chile, 37°15'S, 73°08'W, 13.05.85. Found dead.	8 430 km
9-58368, nestling	10.02.85	Napier, New Zealand, 39°29'S, 176°54'E, May 1985. Found weak, released.	9 590 km
9-58449, nestling	26.02.85	Tweedheads, Australia, 28°10'S, 153°31'E, 25.07.86. Found sick, ring removed.	9 479 km
9-59118, nestling	10.03.87	Off Geraldton, Australia, 28°05'S, 113°31'E, 26.06.87. Caught and released.	6 731 km
Northern giant petrel			
9-57605, nestling	26.01.85	Kare Kare, New Zealand, 36°59'S, 174°29'E, 27.10.85. Found dead.	9 741 km
9-58989, nestling	01.02.87	Davey River, Tasmania, 43°14'S, 145°56'E, 07.04.87. Found weak, released on 30.4.87 at Labillardiere Peninsula, Tasmania.	7 765 km
J03293, breeding adult	26.09.84	Paternoster, South Africa, 32°44'S, 17°52'E, c. 24.11.86. Found sick, apparently died.	2 303 km
Giant petrel (species uncertain)			
9-05559	1977-1978	At sea, 37°15'S, 56°10'E, 10.05.80. Killed by a fish hook from fishing vessel.	1 853 km
Subantarctic skua			
657-61856, nestling	10.01.66	At sea, off Orange River mouth, South Africa, 28°38'S, 16°25'E, 15.08.66. Entangled in fishing line.	2 746 km
657-61891, nestling	13.01.66	Annobon Island, Equatorial Guinea, 1°15'S, 5°36'E, 20.07.66. Recaptured.	5 953 km
8-22866, nestling	05.01.87	East of Arniston, South Africa, 34°39'S, 20°14'E, 04.04.87. Found dead.	1 999 km
8-23050, nestling	31.12.86	Fort-Dauphin, Malagasy Republic, 24°02'S, 47°00'E, 19.03.87. Found weak, kept in captivity.	2 566 km
8-30335, adult	04.10.84	Cape Infanta, South Africa, 34°25'S, 20°51'E, 07.05.85. Found dead.	1 982 km

* – shortest (great circle) distance between ringing and recovery points.

^b – BS10916 added.^c – Watling (1984)

Table 3
Recoveries and recaptures of foreign-ringed birds at Marion and Prince Edward Islands, June 1982 – July 1987,
including records previously unreported

Species, ring number and age at ringing	Ringing date	Recovery/ recapture date	Ringing location	Status when recovered/recaptured	Displacement
King penguin					
TA1282 ^a , nestling	12.11.73	15.11.75	Ile de la Possession, Crozets 46°25'S, 51°45'E	recaptured	1 068 km
TA1455 ^a , nestling	06.12.73	20.01.77	Ile de la Possession, Crozets 46°25'S, 51°45'E	recaptured, moulting	1 068 km
TA1560 ^a , adult	10.12.75	09.05.77	Ile aux Cochons, Crozets 46°06'S, 50°15'E	recaptured	960 km
TA2485 ^a , nestling	10.12.75	20.01.77	Ile de la Possession, Crozets 46°25'S, 51°45'E	recaptured, moulting	1 068 km
TA10402, adult	18.11.79	14.10.82	Ile de la Possession, Crozets 46°25'S, 51°45'E	recaptured	1 068 km
TA11670, adult	18.12.80	07.11.82	Ile de la Possession, Crozets 46°25'S, 51°45'E	recaptured, ring removed	1 068 km
Wandering albatross					
1400199 (2?), unknown	04.07.59	20.03.84 ^b	off Malabar, Australia 33°58'S, 151°16'E	breeding	8 854 km
14025756 ^c , adult	01.08.65	10.12.78	off Malabar, Australia 33°58'S, 151°16'E	recaptured	8 854 km
14026278, adult	27.09.69	18.04.87 ^b	off Malabar, Australia 33°58'S, 151°16'E	breeding	8 854 km
14033229 ^d , adult	18.08.79	13.02.87	off Woollongong, Australia 34°24'S, 151°00'E	breeding	8 790 km
14033494, unknown	12.08.78	17.12.84	off Woollongong, Australia 34°24'S, 151°00'E	breeding	8 790 km
14035105 ^e , adult	10.08.69	07.12.82 13.12.83 02.12.84	off Malabar, Australia 33°58'S, 151°20'E	breeding recaptured recaptured	8 846 km
14037693 ^f , adult	17.08.60	26.11.84	off Bellambi, Australia 34°22'S, 150°56'E	breeding suspected	8 788 km
14037764, unknown	29.08.70	20.03.84 ^b	off Austinmer, Australia 34°18'S, 150°58'E	breeding	8 804 km
14039075 ^a , unknown	23.07.72	09.12.75	off Austinmer, Australia 34°18'S, 150°58'E	recaptured	8 804 km
14039430 ^a , adult	04.08.73	24.04.79	off Austinmer, Australia 34°18'S, 150°58'E	recaptured	8 804 km
BS5815 ^b , adult	12.03.73	17.05.83 15.04.87	Ile de la Possession, Crozets 46°25'S, 51°45'E	breeding breeding	1 068 km
BS6249, adult	21.11.74	07.12.84	Ile de la Possession, Crozets 46°25'S, 51°45'E	breeding suspected	1 068 km
BS6767, adult	07.02.76	03.01.85	Ile de la Possession, Crozets 46°25'S, 51°45'E	breeding suspected	1 068 km
BS9431, nestling	07.10.77	05.02.84	Ile de la Possession, Crozets 46°25'S, 51°45'E	breeding suspected	1 068 km
BS9682, adult	18.02.78	17.04.87 ^b	Ile de la Possession, Crozets 46°25'S, 51°45'E	recaptured	1 068 km
BS9698, chick	06.10.78	15.04.87	Ile de la Possession, Crozets 46°25'S, 51°45'E	recaptured	1 068 km
BS11149, adult	11.04.86	14.01.87	Ile de la Possession, Crozets 46°25'S, 51°45'E	displaying	1 068 km
Southern giant petrel					
BS7204, adult	11.07.77	07.11.84	Ile de la Possession, Crozets 46°25'S, 51°45'E	breeding	1 068 km
Northern giant petrel					
J00703, adult	28.09.77	12.10.86	Wolf Bay, S.W.A./Namibia 26°49'S, 15°07'E	breeding	2 985 km
J00903, unknown	25.01.78	04.11.84	Wolf Bay, S.W.A./Namibia 26°49'S, 15°07'E	breeding	2 985 km
Australasian gannet					
CF16751 ^g , unknown	Jan 1980	02.10.82	Ile de la Possession, Crozets 46°25'S, 51°45'E	recaptured	1 068 km

^a – not previously reported (Berruti *et al.* 1975, Burger & Morant 1977, Brown & Oatley 1982).

^b – refers to Prince Edward Island.

^c – not previously reported (Brown & Oatley 1982), although previously recaptured 22.02.77 (Burger & Morant 1977).

^d – previously recaptured 02.01.80 (Brown & Oatley 1982).

^e – previously recaptured 12.12.76 and 15.12.78 (Burger & Morant 1977, previously unpublished record).

^f – retrapped on four separate occasions (09.09.62, 15.08.70, 02.08.75 and 03.07.77) within 10 km of ringing locality (Cam 1985, Australian Bird and Bat Banding Scheme).

^g – not previously reported (Brown & Oatley 1982), although previously recaptured 28.07.76 (Burger & Morant 1977).

^h – previously recaptured 03.03.75, 20.02.77, 11.04.78 and 16.02.79 (Berruti *et al.* 1975, Burger & Morant 1977, Brown & Oatley 1982, previously unpublished record).

ⁱ – previously recaptured 22.10.80 and 13.11.81 (Brown & Oatley 1982).

Table 4
Numbers of movements of ringed birds from or to the Prince Edward Islands, 1951-1987

Species	Ringed at Prince Edward Islands	Ringed elsewhere	Totals
King penguin	1 (0,58%)*	25	26
Wandering albatross	12 (0,30%)	37	49
Greyheaded albatross	2 (0,47%)	0	2
Southern giant petrel	10 (0,49%)	1	11
Northern giant petrel	3 (0,36%)	2	5
Unidentified giant petrels	2 (0,66%)	0	2
Australasian gannet	0	1	1
Subantarctic skua	10 (0,92%)	1	11
Totals	40 (0,32%)	67	107

* - percentage of total ringed (Table 1).

4). Based on the numbers of birds ringed at the Prince Edward Islands (Table 1), the percentage of Prince Edward Islands-ringed birds recovered or recaptured elsewhere is under 1 per cent for all species, with the Subantarctic skua having the highest percentage (Table 4).

Twenty-six flipper-banded king penguins have been recaptured after moving between Marion Island and Iles Crozet, 1 068 km apart (great-circle distance) (Berruti *et al.* 1975, Burger & Morant 1977, Brown & Oatley 1982, Tables 3 & 4). The longest elapsed time between ringing and recapture of French-ringed birds at Marion Island was 69 months (mean 20 months; Table 5), but all others were less than the four years (48 months) given as the minimum age of first breeding by Barrat (1976). No French-ringed king penguins have been recaptured at Marion Island since 1982, although research has continued within the species' breeding colonies at Marion. This cessation is probably related to the fact that no king penguins were flipper-banded at Iles Crozet and Kerguelen between 1982 and 1986 (Oatley & Cooper 1985, Oatley 1987, Oatley 1988, H. Weimerskirch *in litt.*) where

Table 5
Elapsed times (months) of king penguins recaptured at Marion Island previously ringed at Iles Crozet

Age class	Elapsed times			No.
	Mean	Standard deviation	Range	
Birds ringed as chicks	18,7	9,0	12-37	13
Birds ringed as adults	21,9	17,8	7-69	12
All birds	20,2	13,7	7-69	25

9 602 individuals had been previously flipper-banded (Weimerskirch *et al.* 1985). In the 1986-87 austral summer only 130 king penguins, all adults, were banded at Iles Crozet (H. Weimerskirch *in litt.*). This assumes that either the French flipper bands have all been lost, or (as seems more likely) the French-ringed birds recaptured at Marion Island were young individuals, as suggested by Barré *et al.* (1976) and Weimerskirch *et al.* (1985), and that now they have reached breeding age they no longer wander so far afield.

Weimerskirch *et al.* (1985) have commented on the seasonal occurrence of French-ringed king penguins at Marion Island, stating that birds mainly occurred during the moulting period. Our data confirm this. Twenty-one individuals (84 %) of the 25 Iles Crozet birds were recaptured at Marion Island between November and January and at least 16 (76 %) of these were reported to be moulting (Table 6). The four individuals recaptured in other months were not reported to be moulting. The single Marion Island-ringed king penguin (H1504) recaptured at Ile de la Possession, Crozets (Brown & Oatley 1982, Table 4) was not described as moulting when recaptured, but as "en parade" (=displaying) (South African Bird Ringing Unit unpubl. data).

The French-ringed king penguin recaptured at Marion Island in July (TA4465, Burger & Morant 1977, Table 5) was found breeding with a chick. The bird was ringed as an "adult" at Ile de la Possession (Burger & Morant 1977, Weimerskirch *et al.* 1985). It may have been a Marion-fledged individual visiting Ile de la Possession as a pre-breeder and therefore does not constitute proof of breeding interchange between the two populations.

Wandering albatross movements to and from the Prince Edward Islands represent 46 per cent of movements for all species (Table 4). Three times as many "foreign-ringed" birds have been recaptured at Marion Island than Marion-ringed birds have been recovered or recaptured elsewhere (Table 4), reflecting the value of checking such conspicuous and easily approached birds at their breeding sites for the presence of rings. Most movements were to and from Iles Crozet and Australian waters. The 49 movement records support suggestions previously made that the species undergoes circumpolar migrations in an easterly direction (e.g. Tickell & Gibson 1968, Weimerskirch *et al.* 1985), although this may not be true of wandering albatrosses breeding at Gough Island, which belong to the smaller subspecies *D. e. dabbenean* (Cooper 1988).

Movements between the Prince Edward Islands and Iles Crozet (18 records) have not resulted in further records of breeding interchange since BS0777 which fledged at Ile de la Possession and was recaptured breeding at Marion Island (Burger & Morant 1977, Mougins 1977). However, at least one bird (BS9431), ringed as a chick at Ile de la Possession, has been seen "courting" on Marion Island (M. de L. Brooke *in litt.*), so further breeding interchange may occur. Three Marion Island-ringed chicks (J01104, J01425 (two occasions) and J01523, Table 2) have been recaptured at Ile de la Possession, but none was reported as breeding.

Table 6
Seasonal occurrence of king penguins recaptured at Marion Island previously ringed at Iles Crozet

Month	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Totals
Numbers*	0	1	0	1	1	6(4)	3(2)	12(10)	0	0	0	1	25(16)

* - Numbers of individuals definitely known to be moulting when recaptured are given in parentheses

Two foreign-ringed wandering albatrosses (1400199(2?) and 14037693, Table 3) that were over 24 years old when last recaptured at the Prince Edward Islands are notable.

The two greyheaded albatrosses recovered away from Marion Island (Brown & Oatley 1982, Tables 2 & 4) were both ringed as nestlings. Brown & Oatley (1982) give incorrect recovery coordinates for 9-06296: it was recovered at sea at 40°27'S, 97°17'E. The great circle distance they cite (4 724 km) is, however, correct. Both birds had moved in an easterly direction. Greyheaded albatrosses ringed as nestlings at South Georgia also showed easterly movements (Tickell 1967).

After fledging, juveniles of both giant petrel species are known to migrate large distances in short periods to more northerly latitudes throughout the southern hemisphere (Tickell & Scotland 1961, Hunter 1984a). Probably most juveniles undertake a circumpolar migration in an easterly direction using the prevailing westerly winds (Stonehouse 1958, Tickell & Scotland 1961, Sladen *et al.* 1968, Hunter 1984a). Most long distance recoveries and recaptures occur in the year of fledging and there is a tendency for birds to be found progressively later after fledging the farther east one goes from their natal grounds (Hunter 1984a). The seven southern giant petrel *Macronectes giganteus* and two northern giant petrel *M. halli* movements of birds ringed at Marion Island as nestlings (Berruti *et al.* 1975, Brown & Oatley 1982, Table 2) all fit this general pattern although a southern giant petrel (9-58360) recovered in Chile had moved very rapidly, and the recovery of 9-52203 is one of the most northerly reports for this species (Watling 1984, Table 2). The rates of recovery for nestlings and from Marion Island are similar for both species (0,87 % for southern giant petrels and 0,65 % for northern giant petrels). Hunter (1984a) found a similar rate of recovery for northern giant petrel nestlings from South Georgia in the late seventies but there was a higher rate for southern giant petrels from the same locality.

Although it is very unusual for giant petrels to breed at localities different to where they were born (occasionally such breeding interchange does occur), they may visit other breeding islands during exploratory movements in their pre-breeding years (Hunter 1984a). The three birds originally ringed at Wolf Bay, South West Africa/Namibia and Ile de la Possession, Crozets and subsequently found breeding at Marion Island (Table 3) were, therefore, probably ringed during their pre-breeding years before their return to Marion Island from where they had originally fledged.

The recovery of an adult northern giant petrel (J03293), which was originally ringed while breeding, on the South African mainland during a subsequent breeding season is unusual (Table 2). This may have been a bird that was taking a year off from breeding (see Hunter 1984b) or perhaps had lost its mate. Although wintering and nonbreeding adults normally stay around Marion Island (pers. obs.) this recovery suggests that a small number of adult giant petrels may range farther afield.

Subantarctic skuas leave Marion Island during the winter months (pers. obs.) and the 10 recoveries reported (Berruti *et al.* 1975, Brown & Oatley 1982, Table 2) indicate that both adults and juveniles regularly disperse as far as the southern African mainland. Some of these birds penetrate quite far north as shown by the recovery of 657-61981 in Equatorial Guinea and 8-23050 in the Malagasy Republic (Table 2).

There are three records of interchange of Subantarctic skuas between Marion Island and Iles Crozet. It is possible

that birds hatched at one of these sites may subsequently breed at the other, although there is no proof of this as yet. Further ringing effort is needed to establish what level of gene flow occurs and whether it involves other sub-Antarctic breeding sites.

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