

ANTARCTIC AND SOUTHERN OCEAN BIRD BANDING REVIEW, JULY 1982 - JUNE 1987

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SUMMARY

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A provisional total of 24 205 Southern Ocean birds of 54 species was banded by 10 nations between July 1986 and June 1987 at various Antarctic, sub-Antarctic and southern temperate localities. Penguins (38%) and procellariiforms (51%) were primary targets of banding effort. A review of updated banding totals for the five July-June years of 1982 - 1983 to 1986 -1987 reveals that 91 514 birds of 60 species were banded, 65 839 (72%) of these belonging to only 20 species.

INTRODUCTION

At the meeting in Cambridge, United Kingdom, in August 1982, the Biomass Working Party on Bird Ecology (then fulfilling the role of the SCAR Bird Biology Subcommittee) recommended that the South African Bird Ringing Unit (SAFRING) should set up and operate a Central Data Bank (CDB) for co-ordination of Antarctic and sub-Antarctic bird banding, initially on a two-year trial basis (Anon. 1982). The prime function and rationale of the CDB is to compile an annual banding report, listing the diverse banding efforts of the various national research teams and compiling totals of young and full-grown birds banded in each species, in order that a comprehensive summary be made available in a single publication. These compilations are made possible by submission to the CDB of primary banding data or summaries of species banded in each austral summer by the various national research teams operating from Antarctic and sub-Antarctic bases. The CDB curates duplicate sets of banding data for all those SCAR nations which submit their records and thus provides backup security against accidental loss of records by

individual schemes. By virtue of these comprehensive data sets the CDB is also able, on occasion, to trace the origin, date and locality of banding of colour-marked birds or of recovered bands which have numbers but no addresses.

This fifth annual report summarises banding activities for the period July 1986 to June 1987 and, at the request of the SCAR Bird Biology Subcommittee (Anon. 1990), also reviews banding effort over the five-year period covered by the CDB reports to date (Oatley & Cooper 1985, Oatley 1987, 1988, 1989). Opportunity is taken to update totals for certain species in those years for which data were received only after publication of the relevant annual report. The present review cannot be brought more up to date because at time of final completion (November 1990) banding data for 1987-1988 to 1989-1990 are still awaited from some nations.

METHODS

Banding data for the July 1986 - June 1987 year were extracted, computerised and processed to provide species' and national totals. Species' totals

were subdivided into two age-groups of young (birds hatched in the review period) and full-grown (all birds not known to be hatched in the review period). Age categories were inadvertently omitted from data supplied by the Australian Bird and Bat Banding Scheme and had not been received by the time of compilation, so all Australian banded birds for the 1986 - 1987 period have been placed in the full-grown category, with the exception of Shy Albatross *Diomedea cauta* in which the bulk of the banding effort is known to be focused on chicks. As in the previous report (Oatley 1989), banding totals include Southern Ocean species from the Australian continental islands and offshore waters and the New Zealand mainland, with the exception of Kelp Gulls *Larus dominicanus* in which banding totals reflect only sub-Antarctic and Antarctic populations.

Totals for 1983 - 1984 and 1984 - 1985 do not include banding on the New Zealand mainland, but

1982 - 1983 totals probably do since these were derived from Cossee (1984). Comprehensive penguin banding data supplied recently by Dr. W. Z. Trivelpiece, formerly of the Point Reyes Bird Observatory, U.S.A., has significantly increased banding totals for the years 1982 - 1983 to 1984 - 1985. All these totals are further supplemented by other data received since publication of the original annual reports.

RESULTS

Data received by the CDB indicate that 24 205 birds of 54 species were banded in the 1986 - 1987 year by 10 nations. In terms of family groupings, penguins attracted the most banding effort, followed by albatrosses and petrels (Table 1). As in the previous year, these three families accounted for 88% of banding effort in the review period.

TABLE 1
BANDING EFFORT AT FAMILY LEVEL, 1986-1987

Family	Number of species banded	Number of birds banded	Percentage of total
Spheniscidae Penguins	10	9 259	38.3
Diomedeidae Albatrosses	9	6 543	27.0
Procellariidae Petrels and shearwaters	22	5 640	23.3
Hydrobatidae Storm petrels	4	129	0.5
Pelecanoididae Diving petrels	1	24	0.1
Phalacrocoridae Cormorants	2	1 045	4.3
Chionidae Sheathbills	2	282	1.2
Stercorariidae Skuas	2	1 125	4.6
Laridae Gulls	1	155	0.6
Sternidae Terns	1	3	<0.1
Totals	54	24 205	100.0

Table 2 provides a national breakdown of banding effort. The Netherlands is included on the basis of an expedition to South Georgia. Regional subtotals are provided and indicate a noteworthy concentration of banding effort in the South Shetland Islands.

Table 3 provides a breakdown of national contributions to banding of Antarctic and Southern Ocean birds for each year from 1982 - 1983 to 1986 - 1987 and shows a grand total of 91 514 birds banded in those five years. It should be noted that totals for the first three years do not include Southern Ocean birds banded in Australian waters and islands.

In Table 4 individual species' totals, arranged in systematic order and subdivided by age group, are given for each of the five years. A total of 60 species has been banded. Table 5 lists the 12 most frequently banded birds and shows that 48% of the banding effort has been directed at only 10% of the species.

DISCUSSION

The combined banding efforts of the national SCAR teams assume substantial proportions when summarised for a five-year period. This is especially satisfactory in view of the arduous conditions in which the banding personnel have to operate. Table 5 lists the top 20% of species to which consistent annual banding effort is directed. It is noteworthy that most penguin banding is concentrated in the Antarctic; sub-Antarctic populations of the genera *Eudyptes* and *Aptenodytes* are relatively understudied.

Table 4 shows that half of the 60 species listed have cumulative totals lower than 500, and 18 of these have totals below 100. Some of these low totals reflect the relative rarity of the species, some others derive from the activities of individual banders in Australia and New Zealand, but a substantial

portion probably represents opportunistic or casual banding.

Because most pelagic birds, especially the small species, have extremely low probability of recovery away from the banding site, it was suggested in the first of these annual reports (Oatley and Cooper 1985) that satellite tracking of a few birds carrying radio transmitters would yield more data on movements in one season than banding was likely to do in centuries. Jouventin & Weimerskirch (1990) have recently demonstrated in dramatic fashion how effective satellite tracking can be by fitting radio transmitters to Wandering Albatrosses *Diomedea exulans* at the îles Crozet. However, satellite tracking is currently only feasible for large birds over short time spans. Conventional banding is therefore still required for the smaller species and to deduce movements over longer periods.

Although banding will continue to yield records of movements, its main function will increasingly be to provide data on longevity, timing and duration of moult, age at first breeding, pair fidelity and other aspects of reproductive behaviour and demography. Such banding should only be attempted as part of detailed long-term demographic studies (e.g. Ainley *et al.* 1983, Weimerskirch & Jouventin 1987, Croxall *et al.* 1990)

In the light of this it is appropriate to question the usefulness of opportunistic or casual banding. Although it is easy to understand the impulse to put a band on, say a storm petrel caught on a ship in the Southern Ocean (there is always the chance that it could be recovered), there is nevertheless a cost to such action in terms of the concomitant time needed for record keeping and analysis. This cost becomes significant when multiplied by scores of such records in successive years. Banding in the Antarctic and Southern Ocean should be restricted to that required for undertaking long-term demographic studies, for short-term

TABLE 2
NATIONAL DISTRIBUTION OF BANDING EFFORT, 1986-1987

Nation	Banding regions	Regional subtotals		National totals		Percentage of grand total
		Species	Birds	Species	Birds	
Australia	Australian continental islands	7	2 023	20	4 050	16.7
	Macquarie Island	3	129			
	Heard Island	4	58			
Brazil	Australian Antarctic Territory	8	1 840			
	South Shetland Islands	10	2 565	10	2 565	10.6
Chile	South Shetland Islands	4	419	4	419	1.7
	îles Crozet	15	1 471	30	2 938	12.1
France	îles Kerguelen	13	719			
	île Amsterdam	2	132			
	Terre Adélie	5	616			
German Democratic Republic	South Shetland Islands	7	706	7	706	2.9
The Netherlands	South Georgia	1	19	1	19	0.1
	South Island	5	336	18	2 707	11.2
New Zealand	Chatham Islands	5	135			
	Snares Islands	2	409			
South Africa	Campbell Island	9	1 827			
	Tristan da Cunha	1	41	12	2 685	11.1
	Gough Island	5	361			
United Kingdom	Prince Edward Islands	7	2 257			
	Bird Island, South Georgia	6	2 807	9	4 225	17.5
United States of America	Signy Island, South Orkney Is.	3	1 418			
	King George Island,					
	South Shetlands	3	3 891	3	3 891	16.1
Total				24 205	100.0	

TABLE 3
 FIVE-YEAR SUMMARY OF NATIONAL BANDING TOTALS OF ANTARCTIC AND SOUTHERN OCEAN BIRDS,
 1982-1987

Nation	1982-1983	1983-1984	1984-1985	1985-1986	1986-1987	Total birds banded
Australia	73	1 072	2 358	1 963	4 050	9 516
Brazil	0	4 025	1 184	3 108	2 565	10 882
Chile	0	0	368	120	419	907
France	688	691	1 747	1 841	2 938	7 905
German Democratic Republic	380 *	877 *	1 075	544	706	3 582
The Netherlands ¹	0	0	0	0	19	19
New Zealand	2 923 *	570	2 951	4 562	2 707	13 713
Norway ¹	0	0	1 570	0	0	1 570
South Africa	859	1 844	2 359	721	2 685	8 468
United Kingdom	6 329 ²	1 972	3 565	3 940	4 225	20 031
United States of America	2 730 *	2 028 *	3 123 *	3 149	3 891	14 921
Annual totals	13 982 *	13 079 *	20 300 *	19 948	24 205	91 514

* Total incremented with data received after publication of relevant annual report.

¹ Included by virtue of single expedition to South Georgia

² Includes Denstone Expedition to Inaccessible Island.

TABLE 4
NUMBERS OF YOUNG AND FULL-GROWN BIRDS Banded FOR EACH SPECIES IN EACH JULY-JUNE YEAR FROM 1982 TO 1987

Species	1982 - 1983	1983 - 1984	1984 - 1985	1985 - 1986	1986 - 1987	Totals
Emperor Penguin <i>Aptenodytes forsteri</i>	-	-	-	23	0	594
King Penguin <i>Aptenodytes patagonicus</i>	-	-	0	-	0	180
Adelie Penguin <i>Pygoscelis adeliae</i>	1 000	1 379	1 522	128	195	2 602
Chinstrap Penguin <i>Pygoscelis antarctica</i>	416	712	503	1 115	321	1 800
Gentoo Penguin <i>Pygoscelis papua</i>	790	120	821	76	695	1 364
Rockhopper Penguin <i>Eudyptes chrysocome</i>	0	0	0	60	403	665
Macaroni Penguin <i>Eudyptes chrysolophus</i>	0	1	300	0	87	368
Royal Penguin <i>Eudyptes schlegelii</i>	-	-	-	-	0	24
Snares Crested Penguin <i>Eudyptes robustus</i>	81	199	282	-	291	6
Yelloweyed Penguin <i>Megadyptes antipodes</i>	150	34	361	164	103	1 541
Wandering Albatross <i>Diomedea exulans</i>	1 278	1 272	1 782	352	1 745	8 758
Royal Albatross <i>Diomedea epomophora</i>	623	0	264	113	0	2 273
Amsterdam Albatross <i>Diomedea amsterdamensis</i>	-	0	-	-	3	5
Blackbrowed Albatross <i>Diomedea melanophrys</i>	1 060	75	489	471	59	306
Greyheaded Albatross <i>Diomedea chrysoloma</i>	621	207	367	272	176	560
Yellownosed Albatross <i>Diomedea chlororhynchus</i>	659	1 410	231	117	263	210
Shy Albatross <i>Diomedea cauta</i>	-	-	990	10	14	1 883
Sooty Albatross <i>Phoebastria fusca</i>	60	82	63	15	54	89
Lighmantled Sooty Albatross <i>Phoebastria palpebrata</i>	15	0	50	31	20	36
Southern Giant Petrel <i>Macronectes giganteus</i>	557	1 201	919	649	512	1 331
Northern Giant Petrel <i>Macronectes halli</i>	19	0	516	298	0	179
Antarctic Fulmar <i>Fulmarus glacialis</i>	18	11	61	331	9	0
Antarctic Petrel <i>Thalassoica antarctica</i>	-	396	0	1 987	117	42
Pintado Petrel <i>Diapton capense</i>	39	4	484	129	1 305	484
Snow Petrel <i>Fugadroma nivea</i>	262	128	241	182	64	51
Greatwinged Petrel <i>Pterodroma macroptera</i>	404	31	1	62	310	15
Softplumaged Petrel <i>Pterodroma mollis</i>	0	5	-	-	0	1
Mottled Petrel <i>Pterodroma inexpectata</i>	-	-	-	-	27	0
Whiteheaded Petrel <i>Pterodroma leucorhoa</i>	-	-	-	38	0	22
Kerguelen Petrel <i>Pterodroma brevirostris</i>	0	1	15	32	0	14
Blue Petrel <i>Halobaena caerulea</i>	47	33	0	79	33	0
Broadbilled Prion <i>Pachyptila vittata</i>	0	106	3	10	0	64
Antarctic Prion <i>Pachyptila desolata</i>	-	-	0	0	45	6
Mediumbilled Prion <i>Pachyptila salvini</i>	-	-	0	7	0	17
Fairy Prion <i>Pachyptila turtur</i>	13	563	0	15	0	50
Slenderbilled Prion <i>Pachyptila belcheri</i>	-	-	0	8	22	92

Whitechinned Petrel <i>Procellaria aequinoctialis</i>	0	5	12	75	0	5	23	245	8	37	410
Grey Petrel <i>Procellaria cinerea</i>	1	0	0	18	-	-	-	-	37	41	97
Great Shearwater <i>Puffinus gravis</i>	109	980	-	-	-	-	-	-	0	79	1 168
Sooty Shearwater <i>Puffinus griseus</i>	2	14	-	-	-	-	-	-	18	1	35
Little Shearwater <i>Puffinus assimilis</i>	-	-	-	-	0	23	-	-	-	-	23
Wedgetailed Shearwater <i>Puffinus pacificus</i>	-	-	-	-	-	-	-	-	0	27	27
Short-tailed Shearwater <i>Puffinus tenuirostris</i>	-	-	-	-	-	-	-	-	0	2	2
Leach's Storm Petrel <i>Oceanodroma leucorhoa</i>	-	-	0	3	-	-	-	-	-	-	3
Wilson's Storm Petrel <i>Oceanites oceanicus</i>	0	962	0	6	13	5	0	33	3	86	1 108
Whitethroated Storm Petrel <i>Pelagodroma marina</i>	0	44	-	-	0	40	8	326	0	1	419
Greybacked Storm Petrel <i>Garrodia nereis</i>	0	56	-	-	0	4	2	70	0	38	170
Blackbellied Storm Petrel <i>Fregata tropica</i>	-	-	-	-	-	-	-	-	0	1	1
Whitebellied Storm Petrel <i>Fregata gallaria</i>	0	15	-	-	-	-	-	-	-	-	15
South Georgian Diving Petrel <i>Pelecanoides georgicus</i>	-	-	-	-	0	25	31	9	2	22	89
Common Diving Petrel <i>Pelecanoides urinatrix</i>	-	-	-	-	0	84	6	19	-	-	109
Imperial Cormorant <i>Phalacrocorax atriceps</i>	-	-	250	3	598	103	653	15	981	56	2 659
Campbell Island Shag <i>Phalacrocorax campbelli</i>	-	-	-	-	-	-	-	-	0	8	8
American Shearbill <i>Chionis alba</i>	11	34	23	110	23	151	14	83	48	24	521
Lesser Shearbill <i>Chionis minor</i>	18	9	-	-	20	35	26	18	58	152	336
Subantarctic Skua <i>Catharacta antarctica</i>	160	63	279	236	394	226	258	361	820	281	3 078
South Polar Skua <i>Catharacta macconnicki</i>	24	63	25	53	167	59	67	16	3	21	498
Kelp Gull <i>Larus dominicanus</i>	12	4	36	37	94	25	67	235	34	121	665
Kerguelen Tern <i>Sterna virgata</i>	-	-	-	-	5	0	-	-	-	-	5
Antarctic Tern <i>Sterna vittata</i>	2	0	79	20	144	5	21	38	3	0	312
Totals: young/full-grown	8 451	5 531	7 713	5 366	13 717	6 583	14 965	4 983	11 796	12 409	91 514
Total no. of birds	13 982		13 079		20 300		19 948		24 205		

TABLE 5

FIVE-YEAR TOTALS FOR 12 MOST-BANDED SPECIES LISTED
IN DESCENDING ORDER OF NUMBERS

Species	Total nos. banded
Adélie Penguin	9 750
Wandering Albatross	8 758
Chinstrap Penguin	7 574
Southern Giant Petrel	7 389
Gentoo Penguin	5 307
Blackbrowed Albatross	4 544
Yellownosed Albatross	4 328
Pintado Petrel	4 269
Shy Albatross	4 215
Greyheaded Albatross	3 370
Antarctic Petrel	3 257
Subantarctic Skua	3 078
Total no. of birds	65 839

experimental and observational studies where birds need to be individually recognizable for the duration of the study and for co-operative projects designed to ascertain the movements and dispersal of selected species and their age cohorts (e.g. the International Giant Petrel Project initiated and organized by the SCAR-BBS (Anon. 1990).

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ERRATUM

In the report on Antarctic and sub-Antarctic seabird banding for July 1985 - June 1986 (Oatley 1989) the total of full-grown Gentoo Penguins *Pygoscelis papua* in Table 2 (bottom line on p. 37) should read '76' not '716'.