

**SCIENTIFIC COMMITTEE ON ANTARCTIC RESEARCH:
WORKING GROUP ON BIOLOGY: BIRD BIOLOGY SUBCOMMITTEE. MINUTES OF
MEETING, 31 JULY–2 AUGUST 1996, CAMBRIDGE, UNITED KINGDOM**

1. PARTICIPANTS AND AGENDA

Members and observers (Annex 1) were welcomed to the meeting by the Chair, Mr J. Cooper. Apologies had been received from Drs G. Robertson and M. Sallaberry. Resignations had been received from Profs G.L. Hunt Jr and W.R. Siegfried, and J. Cooper expressed the Subcommittee's thanks for their long service.

The draft agenda was adopted with minor alterations (Doc. 1, listed in Annex 2).

2. MINUTES OF THE PREVIOUS MEETING

The minutes of the previous meeting, held in Padua, Italy, in May 1994 had now been published in *Marine Ornithology* 22: 253-268 of 1995 (Doc. 2).

3. CENTRAL DATA BANK (CDB) FOR ANTARCTIC BIRD BANDING

J. Cooper reported that the CDB is in limbo because funding had been discontinued for some time and efforts within South Africa to find funds had been unsuccessful. Mr J.A. van Franeker suggested that it was important to continue the data bank, especially with the growing use of transponders for which there is no central register. Recording the use of transponders had not been part of the data bank, but if the service were to continue, this could be a sensible addition to be recommended. Up to 12 countries had provided information to the data bank, although there were difficulties obtaining information from some. The current situation is that there is a significant quantity of outstanding information to obtain and incorporate, and this must be taken into account if the scheme is to be resuscitated. If fewer countries were to contribute to the data bank, the worth of the data bank would be devalued. SCAR members should be made aware of the need to keep banding records up-to-date, in the same way that the upkeep of the seal-tagging register is a mandatory obligation. It was suggested that the parties involved should pay for the service. It was agreed that a recommendation would be made to the SCAR Working Group on Biology that the scheme be continued and supported financially by SCAR.

Dr J.P. Croxall reminded the meeting that Drs K.R. Kerry and W.Z. Trivelpiece had offered to develop a form for reporting the use of transponders. It seemed that this intersessional activity had not been undertaken, but it was felt that an appropriate record of such tag use was necessary. The Subcommittee recorded its thanks to the South African Bird Ringing Unit of the University of Cape Town for hosting the CDB since its inception. J.P. Croxall reported that there was some evidence that the Chinese had been banding birds but no records were currently available.

4. RECENT PUBLICATIONS ON ANTARCTIC AND SUB-ANTARCTIC BIRDS

It was agreed that the annual listing of publications was especially helpful for new researchers in the region and for drawing attention to papers in national literatures. The service has been running annually since 1986 and is published in *Marine Ornithology*. J. Cooper recorded his thanks to Ms Christine Phillips, Librarian, British Antarctic Survey and E.J. Woehler for compiling recent lists. Lists were tabled for 1992, 1993, and 1994 (Docs 3-5), all of which were in press with *Marine Ornithology*. In addition, preliminary lists for 1995 and 1996 were tabled (Docs 6 & 7). It was requested that members provide additional references for the lists to Ms Phillips.

5. INTERNATIONAL GIANT PETREL PROJECT

Through the Subcommittee, nations had been encouraged to band as many chicks as possible of a single cohort of giant petrels *Macronectes* spp. in 1988/89. All recoveries were to be reported to the Subcommittee for collation. Ms D.L. Patterson had agreed to take over this task from Dr S. Hunter at the 1994 meeting of the Subcommittee. Of about 7500 chicks banded, only 25 recoveries had been received. Some countries have not supplied data on recoveries: notably Brazil, Chile and Germany. It was considered about approximately 75% of the recoveries that might be expected had been received, given the number of birds banded by the countries that have yet to report. It was agreed that the outstanding recovery information be requested from Australia, Brazil, Chile, Germany and New Zealand. A deadline for receipt of recoveries should be established, after which the collation of recoveries could be completed and a report prepared for the next meeting of the Subcommittee.

6. COMPILATION OF MASSES OF ANTARCTIC AND SUB-ANTARCTIC SEABIRDS

J.A. van Franeker suggested the usefulness of having an agreed list of seabird masses that could be used in studies. Although this issue had been previously addressed, one of the major problems is that bird masses are notoriously variable and therefore agreed averages were difficult to determine. Dr W.R. Fraser reported that no progress had been made in updating information from the Handbook of Australian, New Zealand and Antarctic Birds (HANZAB). He had compiled all mass data from his cruises and will be compiling further data with the intention of circulating a list of masses before the next meeting of the Subcommittee. The SCAR-BBS agreed with thanks that W.R. Fraser should continue with this intersessionally. It was noted that Volume 3 of HANZAB had been published, which included the larids, and that these data were now available.

7. DISEASES

Papers (Doc. 8) from Dr K.R. Kerry were tabled regarding the potential for the introduction of diseases to Antarctic bird populations. The Subcommittee noted the paper by Ms H. Gardner on protocols for taking samples for pathological analysis of disease in monitored species, which should be circulated widely among ornithologists working in the Antarctic. Members and Observers were asked to transmit concerns or questions regarding the draft protocols directly to the authors. Dr G.L. Kooyman suggested that a U.S. programme might get involved with the analysis of samples taken under such a scheme. Dr H. Weimerskirch suggested that other groups (e.g. French and American) screening for diseases should be apprised of the Australian CCAMLR protocols.

It was suggested that authors of the tabled papers compile a list of diseases in birds other than penguins. Without evidence of breaches of the regulations on disposal of wastes, the Subcommittee recognized the concern expressed regarding waste disposal, but noted that many of the seabirds migrate outside the SCAR area of interest and are able to transmit diseases irrespective of any protections and protocols that could be instituted in the Antarctic.

8. PHYSIOLOGICAL STUDIES

A paper from Dr G.S. Fowler (Doc. 9) was tabled with a comment by J. Clarke (Doc. 10) addressing the issue of the collection of blood samples from penguins. G.S. Fowler expected a full manuscript to be ready in the future. Naive people starting blood sampling of seabirds should be apprised of the methodology as outlined by Dr Fowler.

9. SPECIES SYNTHESSES OF ANTARCTIC AND SUB-ANTARCTIC BIRD DISTRIBUTION AND ABUNDANCE

Following the publication of the compilation on penguins by E.J. Woehler, the Snow Petrel *Pagodroma nivea* compilation was now in press (Doc. 11). The status of reviews of other Antarctic and Subantarctic species currently being undertaken by the SCAR BBS were reported by their compilers, as summarized below.

9.1. Antarctic Petrel *Thalassoica antarctica* (Doc. 12)

J.A. van Franeker reported that little extra information had been added to the previous draft. Pelagic distributions suggested many undiscovered breeding areas existed around Antarctica, because the at-sea distributions and abundances were too great to have been supported by the known breeding colonies. Dr S.-H. Lorentsen suggested that satellite images could be used to locate the 'missing' colonies. Information on Antarctic Petrels in the Weddell Sea has been published in *Polar Biology* (Doc. 13). Any outstanding data were to be submitted to J.A. van Franeker by 1 January 1997 to be included in the publication of the review.

9.2 Giant petrels *Macronectes* spp. (Doc. 14)

D.L. Patterson informed attendees that the tabled review was a draft, and that several areas were poorly represented. The discussion will not be written until receipt of data from the

Antarctic Peninsula region from Sally Poncet (promised in August 1996). J. Cooper and J.P. Croxall noted the need to submit recent data from the UK and South Africa. E.J. Woehler indicated that he would ensure all Australian data were made available for the review.

9.3 Cape or Pintado Petrel *Daption capense* (Doc. 15)

Mr P. Hodum presented a rough first draft, and indicated that he was waiting on data from C. Miskelley. J.P. Croxall indicated that the South Georgia data will need to be revised. Dr N.R. Coria offered data from the Argentine programme. Attendees were asked to send outstanding data to P. Hodum by March 1997.

9.4 Antarctic Fulmar *Fulmarus glacialis*

No document was tabled since the compilation is still in an early stage. P. Hodum hoped to have an initial compilation suitable for circulation for the next meeting of the Subcommittee.

9.5 Wilson's Storm Petrel *Oceanites oceanicus* (Doc. 16)

J. Cooper indicated that comments on the review be directed to M.A. Sallaberry. It was noted that M.A. Sallaberry had only covered the Antarctic breeding localities, and had so far omitted the sub-Antarctic islands. Attendees noted that the tabled review was incomplete with regard to the published literature. E.J. Woehler offered to send M.A. Sallaberry the HANZAB text on this species. The Chair would write to M.A. Sallaberry to thank him for progress to date and to encourage him to proceed with the compilation of published and unpublished data.

9.6 Cormorants *Phalacrocorax* spp.

The update to the review tabled at the last meeting of the Subcommittee had not arrived. A fax received from S. Poncet suggested that it would be available in August 1996 for intersessional circulation among members.

9.7 Gulls, terns and skuas

E.J. Woehler indicated some progress on the review of the seven larid species, and indicated that a draft text would be tabled at the next meeting.

9.8 Penguins

J.P. Croxall had continued to collate data on penguin breeding distribution and numbers of penguins. The Argentinians were commended for their efforts to make data available on new penguin colonies. The existence of substantial new data on Rockhopper *Eudyptes chrysocome* and Macaroni *E. chrysolophus* Penguins was noted.

Antarctic and Subantarctic birds that the SCAR BBS did not have under review were: albatrosses, burrowing petrels and endemic land birds. The imminent albatross review by R.P. Gales and HANZAB had covered these groups of species.

9.9 Antarctic Site Inventory

On behalf of Ron Naveen, Ms L. Blight reported (Docs 17-20) on the programme to use tourist vessels as platforms for collecting data (e.g. censuses of breeding birds). She noted that

there are limitations on the data that can be collected, because data are usually restricted to areas where tourist landings occur. The Subcommittee recognized the value of the programme and suggested that authors of the SCAR species reviews contact R. Naveen directly for any population data.

10. THIRD SCAR/CCAMLR REVIEW OF THE STATUS AND TRENDS OF ANTARCTIC AND SUB-ANTARCTIC SEABIRD POPULATIONS

A request from Dr K.-H. Kock, Chair, CCAMLR Scientific Committee to provide a third five-yearly review of Antarctic and sub-Antarctic bird populations had been received inter-sessionally. E.J. Woehler had agreed to undertake the task and had circulated questionnaires and the second SCAR-BBS report to CCAMLR (Doc. 21) before the meeting, producing a draft document (No. 22) for discussion. Tabled papers (Docs 23-26) provided updates on numbers of birds of various species and localities.

10.1 Penguins

E.J. Woehler reported that the penguin sections of the review (Doc. 22) were more complete as others were already reviewing other groups (e.g the review of albatrosses by Dr R.P. Gales, Doc. 23). E.J. Woehler planned to take information on other species from the species reviews tabled at the meeting. The review needed to be completed by October 1996 for submission to CCAMLR. P Jouventin indicated that he would supply census data for Pointe Géologie, Adélie Land, Antarctica and indicated that the Adélie Penguin *Pygoscelis adeliae* population there had been stable for the last 10 years. J. Cooper offered information on Marion Island King Penguins *Aptenodytes patagonicus*. It was pointed out that the table under 'Data Years' should show every year in which census data are available. The consistency of the changes in Adélie Penguin populations in the Ross Sea should be brought out in the report. Dr J. Moreno noted that he had five years' data on Chinstrap Penguins *P. antarctica* at Deception Island from photographs, but had not as yet calculated total numbers. Other members reported various changes to census figures for incorporation in the report.

10.2 Albatrosses

J.P. Croxall suggested that R.P. Gales' revised paper (Doc. 23) should be submitted to CCAMLR to supplement the Subcommittee's tabulations of other taxa. Attendees noted that all species of albatrosses (with the exception of the Sooty *Phoebastria fusca* and Black-browed *Diomedea melanophrys* Albatrosses) had recently been evaluated under IUCN guidelines for their conservation status, and that all the Southern Ocean species were assigned 'threatened' species status.

10.3 Giant petrels

Tabled papers (Docs 14 and 24) include information on recent population changes in these two species. It was noted that the previous SCAR-BBS report had flagged that populations of Southern Giant Petrels *Macronectes giganteus* might be decreasing, whereas the most recent data are equivocal. However, it was noted that recent data are missing from some sites from which large decreases had been previously reported. D.L. Patterson said that some of the populations of Southern Giant Petrels that had reported decreases up to the mid-1980s had continued to decrease.

10.4 Small fulmarine petrels

S.-H. Lorentsen reported very large inter-annual variations in breeding populations of Snow Petrels, with no clear trend apparent.

10.5 Burrowing petrels

The continued lack of quantitative data on recent population trends in this group was noted.

10.6 Cormorants

E.J. Woehler reported large inter-annual variations in the population of the Heard Island Cormorant *Phalacrocorax atriceps nivalis*, with no clear trend apparent. J.P. Croxall noted that rather than a previously flagged increase in this species, there is evidence of stability in the population at Signy Island or, if anything, something of a recent decrease.

10.7 Skuas

The lack of new data from the New Zealand and Indian Ocean islands for the Subantarctic Skua *Catharacta antarctica* was noted. N.R. Coria reported that the apparent large increase in the population at Potter Peninsula, King George Island probably reflected, in part, discrepancies in the areas surveyed.

10.8 General observations

Additional information should be provided to E.J. Woehler immediately. Whereas this review was being undertaken at the request of CCAMLR, it is something that the SCAR-BBS should undertake as a matter of priority. There is a high priority in making sure that all such reviews are as accurate as possible. It was noted that there was a need to restructure the way in which the review is conducted. It was proposed that population data for these reviews be compiled at least one year in advance of the time it needs to be submitted to CCAMLR, thereby leaving time for revision. In the future, there will be a greater emphasis on the SCAR-BBS to show whether the observed and documented changes in populations are statistically significant. Mr P.A. Prince commented that surveying and census work has a low priority in most nation's science programmes, but there is an increased demand for accurate population data and trend assessments, such as the request from CCAMLR. In order to satisfy such requests, greater resources and support are required than at present.

11. REQUEST FROM CCAMLR: COMMENT ON CHANGES TO CURRENT CEMP MONITORING METHODS

The Subcommittee had been asked by K.R. Kerry, Convenor of a CCAMLR subgroup on monitoring methods (Doc. 27) to respond to the proposed changes to monitoring methods in the tabled papers (Docs 28-32). The very short of time available to undertake this task was noted.

11.1 Collection of stomach contents from Cape Petrels

J.A. van Franeker, P. Hodum and N.R. Coria reviewed this protocol (Doc. 28) and amendments were made to it. Debate ensued as to whether seawater or fresh water should be used

for stomach pumping. In the absence of any evidence to the contrary, it was agreed that either could be used. J.A. van Franeker suggested not formalizing these procedures until more details have been published. This methodology would also be applicable to Antarctic Petrels.

11.2 Attachments of instruments

Minor amendments were proposed to the wording of the text (Doc. 29)

11.3 Collection of stomach contents from penguins

D.L. Patterson revised the protocol (Doc. 30). The revision adds more information about how to reduce the stress of handling. Concern was expressed about the use of a 3-kg mass to encourage draining of the sample, as this was thought likely to cause damage.

11.4 Draft standard methods for fulmarine petrels

P. Hodum, J.A. van Franeker and S.-H. Lorentsen reviewed the protocol (Doc. 31) and reported that it was suitable in its present form.

11.5 Use of stomach flushing on Procellariiformes

Concern was expressed by attendees about this protocol (Doc. 32) as it is inadequate in its present form, and it was felt that the method description was too vague for naïve users. It was recommended that the protocol be returned to CCAMLR for redrafting.

11.6 General comments

It was agreed that the SCAR-BBS cannot suggest further protocols unless the following are known: (i) current methods in use, and (ii) potential methods currently being considered by CCAMLR. Therefore, the Subcommittee can only address this issue intersessionally after the appropriate documentation is made available.

12. PENGUIN CONSERVATION ASSESSMENT AND MANAGEMENT PLAN (CAMP)

Some penguin species' conservation status in terms of IUCN Red List Categories (Doc. 33) had been updated on the basis of the low number of responses that had been received by the deadline. What had not changed were the recommendations for further research. These will be reviewed at the Second Penguin CAMP Workshop to be held in Cape Town, South Africa, concurrent with the Third International Penguin Conference in September 1996. Attendees reviewed the taxon data sheets (Doc. 34) to ensure that they were as complete as possible for the CAMP Workshop. Additional data supplied by P. Jouventin and H. Weimerskirch (Doc. 35), and the data prepared by E.J. Woehler (Doc. 22) were then incorporated.

12.1 Emperor Penguin *Aptenodytes forsteri*

E.J. Woehler expressed concern about the potential impact of commercial fisheries. Agreed IUCN status = 'secure'.

12.2 King Penguin *A. patagonicus*

Agreed IUCN status = 'secure'.

12.3 Adélie Penguin *Pygoscelis adeliae*

Agreed IUCN status = 'secure'.

12.4 Chinstrap Penguin *P. antarctica*

It was noted that the 'detailed demographic studies' reported from Point Thomas involved only 21-100 pairs. W.R. Fraser indicated that the Polish data show a sharp decrease in numbers since banding began in 1976. Agreed IUCN status = 'secure'.

12.5 Gentoo Penguin *P. papua*

Agreed IUCN status = 'secure'.

12.6 Macaroni Penguin *Eudyptes chrysolophus*

It was suggested that the SCAR-BBS may want to indicate that there is some concern for the conservation status of this species, given recent indications of a decrease in some populations. If trends at South Georgia were typical of the species as a whole, the status would appropriately be listed as 'vulnerable'. However, this is extrapolating from a small sample, and it was decided to leave Macaroni Penguins in a category outside the formal IUCN threatened categories at present. Agreed status = 'lower risk', but flagging that this may need to be revised to 'vulnerable' when more information is available.

12.7 Royal Penguin *E. schlegeli*

E.J. Woehler reported suspicions that the population at Macquarie Island may be increasing, but this is impossible to assess in the absence of recent surveys. Agreed IUCN status = 'secure'.

12.8 Southern Rockhopper Penguin *E. c. chrysocome*

Agreed IUCN status = 'vulnerable', based on IUCN criteria A1a and A1c (i.e. decreases of over 20% over three generations, and decreases in area of occupancy).

12.9 Eastern Rockhopper Penguin *E. c. filholi*

Dramatic decreases noted south of New Zealand but elsewhere appeared stable. Agreed IUCN status = 'vulnerable', but attendees noted that the populations at the New Zealand southern islands would qualify as 'endangered' (i.e. >50% decrease over three generations) if they were considered on their own.

12.10 Northern Rockhopper Penguin *E. c. moseleyi*

H. Weimerskirch and P. Jouventin noted substantial decreases at Amsterdam and Saint Paul Islands (Doc. 35). Agreed IUCN status = 'vulnerable'

Rockhopper Penguin as a taxon was assigned to the IUCN category 'vulnerable'. Attendees agreed that concern about this species' conservation status in our area of interest should be reported to the SCAR Working Group on Biology.

13. ANTARCTIC PACK ICE SEALS PROGRAMME

Dr J. Bengston accompanied by Drs I. Boyd, D. Siniff and P. Boveng of the SCAR Specialist Group on Seals joined the

meeting to describe the Antarctic Pack Ice Seals (APIS) Programme (Docs 36-38). Briefly, a large coordinated circumpolar survey of seals is planned for the summer of 1998/99. He indicated that collaboration with seabird studies that make use of the logistic resources for the APIS Programme would enhance the prospects of it being supported. J.A. van Franeker inquired about the ship survey techniques that would be used, and whether they would be compatible with seabirds at-sea surveys. D. Siniff said it would be a combination of ship, helicopter and fixed-wing aircraft surveys. I. Boyd noted that there would be core observations carried out by each platform, but each programme would be free to pursue other objectives, including seabird biology. J. Bengtson indicated that some studies would require stopping the survey vessels and handling seals, even during census transects. It was later agreed that APIS might provide some opportunities for surveying seabirds at sea. Although the SCAR-BBS encouraged pack-ice work and offered its general support to APIS, the way the cruises are constructed may not suit the requirements for seabird research. Attendees indicated that is not feasible to develop specific programmes of seabird research at such short notice. J.P. Croxall noted that perhaps the time had come for the SCAR-BBS to be more proactive, and develop an at-sea seabird programme of its own.

14. FISHERY-SEABIRD INTERACTIONS

J. Cooper informed the Subcommittee of two developments associated with this problem:

1. that a group of conservation nongovernmental organizations had submitted a resolution on the subject of seabird (most especially albatross) mortality caused by longline fishing for consideration at the World Conservation Union's First World Conservation Congress in Montréal, Canada to be held in October 1996, and
2. Norwegians had developed methods for the underwater setting of longlines leading to reduced bird mortality.

P.A. Prince voiced his concern that ornithologists attempting to undertake research on seabirds over the Patagonian Shelf were getting little support from their governments. He pointed out that the countries involved (Argentina, Brazil and Uruguay) are signatories to the Antarctic Treaty, and that they should have some responsibility and concern for southern seabirds wintering in their waters.

15. REQUESTS FROM CCAMLR

15.1 Establishing a system for a large-scale banding study

J.P. Croxall commented that there were strong limitations to banding research: these are only as good as our ability to retrieve bands from seabirds caught at sea. This depends upon our ability to put observers on board fishing vessels. P.A. Prince suggested that if new banding efforts are to be effective, they need to be in areas where banding has not occurred extensively before.

15.2 Population genetics of Procellariiformes

The Subcommittee supported genetic studies of seabirds. If island populations could be 'genetically typed', this would generate additional benefits for other seabird research.

16. TOURISM, HUMAN DISTURBANCE AND SEABIRDS

Ms A. Nimon gave a brief overview of her work on the responses of Gentoo Penguins to tourist visitor groups (Doc. 39). She had measured heart rate and behavioural responses. Heart rates increased in some birds but only as tourists approached while the majority of birds studied showed little response. The need to compile similar information from other studies was identified.

17. SKUA DIET REVIEW

A request for information on skua diets from Dr. K. Reinhardt was tabled (Doc. 40) and attendees with information were invited to contact him directly. E.J. Woehler offered to forward photocopies of the relevant HANZAB texts to Dr Reinhardt.

18. SCAR-GOSEAC REPORT

J. Cooper tabled the report of the SCAR Group of Specialists on Environmental Affairs and Conservation (Doc. 41) that he had received just two days before the meeting. He gave a summary of the report, and noted that there was practically no mention of conservation concerns considering vertebrates within the SCAR area of interest.

19. COLLATING AND VALIDATING RECORDS OF VAGRANT BIRDS

J.P. Croxall tabled a review paper on the records of birds at South Georgia (Doc. 42). Attendees agreed that it would be a useful task for someone to be collating and analysing such records for the Southern Ocean region as a whole, although it was acknowledged to be a large task that, however, did not warrant forming a rare birds panel.

20. REPORTS OF MEETINGS HELD AND TO BE HELD

Attendees were informed of relevant scientific meetings that had been held recently and of those to be held over the next two years.

21. REPORT ON TWO SCAR-BBS WORKSHOPS ON SEABIRD AT SEA METHODOLOGY, MARCH 1995 AND JULY 1996.

A report from E.J. Woehler and J.A. van Franeker was tabled and is appended (Doc. 44) along with some papers tabled at the July workshop (Docs 46-48). The final report will be tabled at the next meeting of the Subcommittee in 1998.

22. REPORT ON SCAR-BBS WORKSHOP ON ALTERNATIVE PENGUIN MARKING TECHNIQUES, JULY 1996.

The agenda and tabled papers (Docs 49-52) were tabled and the workshop's report is attached as Annex 3.

On behalf of the Subcommittee J. Cooper thanked the convenors of these two workshops for their efforts.

23. FUTURE WORKSHOPS

Attendees agreed that the SCAR-BBS should ask for funding from the SCAR Working Group on Biology to assist collaborative initiatives to link seabird studies to various interdisciplinary groups such as those dealing with oceanography. The following were seen to be highly desirable: (i) a one-day workshop to set up data compilation for the species' status and trends review into a more rigorous protocol. This workshop could be held in conjunction with the next meeting of the Subcommittee or shortly thereafter. (ii) an independent workshop to establish global initiatives on at-sea seabird research in the SCAR area of interest. The timing of this workshop was to be determined intersessionally, with P. Jouventin indicating interest in hosting such a workshop.

24. RECOMMENDATIONS

Attendees requested that the following recommendations be presented to the SCAR Working Group on Biology:

24.1. The Central Data Bank for Antarctic Bird Banding should be supported by providing funding for someone to be employed at the rate of one-quarter time at the existing data bank in South Africa.

24.2. The SCAR WG-Biology should note the 'vulnerable' conservation status of the Rockhopper Penguin and give research and monitoring of this species a high priority.

24.3. The SCAR WG-Biology supports concerns identified by the Subcommittee with respect to seabird mortality caused by longline fisheries for transmission to SCAR National Committees. Further, a high priority should be given to supporting research activities on Antarctic birds when wintering in waters outside the SCAR area of interest.

24.4 Funding to support two intersessional workshops be requested from SCAR.

25. MEMBERSHIP

It was noted that R. Bannasch had not been able to attend the last two meetings of the Subcommittee and that there had been two resignations. The members unanimously recommended the appointment of Nestor Coria, Juan Moreno and Eric Woehler as replacements. It was recommended that E.J. Woehler be appointed as Secretary and J. Cooper continue as Chair.

26. ANY OTHER BUSINESS

L.S. Davis as outgoing Secretary suggested that all papers for future SCAR-BBS meetings should be tabled no less than one month before each meeting, enabling them to be sent to delegates for reading in advance. This was agreed to and it was noted that the Secretary-elect should inform other organizations of the appropriate dates for submission of material.

27. DATE AND PLACE OF NEXT MEETING

This will be held in Concepcion, Chile, in July 1998. Details of the venue and exact dates will be circulated to members and observers ahead of the meeting.

28. CLOSURE

J. Cooper as Chair and on behalf of all attendees recorded his thanks to the British Antarctic Survey and to J.P. Croxall for hosting the meeting, and for providing excellent facilities and assistance. He thanked L.S. Davis for acting as Secretary over the previous two years, and all the attendees for their involvement.

ANNEX 1

NAMES AND ADDRESSES OF PARTICIPANTS AT THE 1996 MEETING OF THE SCAR BIRD BIOLOGY SUBCOMMITTEE

John Cooper, Chair
African Seabird Group
PO Box 34113
Rhodes Gift 7707
SOUTH AFRICA
jcooper@botzoo.uct.ac.za

Lloyd S. Davis, Secretary
Department of Zoology
University of Otago
PO Box 56, Dunedin
NEW ZEALAND
adelie@stonebow.otago.ac.nz

Louise Blight
Oceanites
#406-1436 Gravely Street
Vancouver, BC, V5L 3A4
CANADA
lblight@axionet.com

Nestor R. Coria
Instituto Antartico Argentino
Cerrito 1248 (1010) Buenos Aires
ARGENTINA
coria@ilpla.edu.ar

Kim Crosbie
Scott Polar Research Institute
Cambridge CB2 1ER
UNITED KINGDOM
pkc100@cus.cam.ac.uk

John P. Croxall, member
British Antarctic Survey
High Cross, Madingley Road
Cambridge CB3 0ET
UNITED KINGDOM
jpcr@bas.ac.uk

Jan A. van Franeker, member
Institute for Forestry and Nature Research
Department of Aquatic Ecology
PO Box 167, NL-1790 AD Den Burg
THE NETHERLANDS
franeker@ibn.dlo.nl

William R. Fraser, member
Department of Biology,
Montana State University
Bozeman, Montana 59717
USA
ubiwf@msu.oscs.montana.edu

Peter Hodum
Department of Avian Sciences
University of California
Davis, CA 95616
USA
pjhodum@ucdavis.edu

Claude Joiris
Ecotoxicology and Polar Ecology
Free University Brussels
BELGIUM
cjoiris@vnet3.vub.ac.be

Pierre Jouventin, member
Centre National de la Recherche Scientifique
Centre d'Etudes Biologiques de Chize
F-79360 Villiers-en-Bois
FRANCE
jouventin@cebc.cnrs.fr

Gerald L. Kooyman
Scripps Institution of Oceanography
University of California San Diego
La Jolla, CA 92093-0204
USA
gkooyman@ucsd.edu

Svein-Haakon Lorentsen
Norwegian Institute for Nature Research
Tungasletta 2
N-7005 Trondheim
NORWAY
svein-hakon.lorentsen@nina.nina.no

Juan Moreno
Museo Nacional de Ciencias Naturales-CSIC
J. Gutierrez Abascal 2
E-28006 Madrid
SPAIN
mcnjm19@pinar1.csic.es

Amanda J. Nimon
Scott Polar Research Institute
University of Cambridge
Lensfield Road
Cambridge CB2 1ER
UNITED KINGDOM
ajn1000@cus.cam.ac.uk

Donna L. Patterson
Department of Biology,
Montana State University
Bozeman, Montana 59717
USA
donna@montana.edu

Peter A. Prince, member
British Antarctic Survey
High Cross Madingley Road
Cambridge CB3 0ET
UNITED KINGDOM

Keith Reid
British Antarctic Survey
High Cross Madingley Road
Cambridge CB3 0ET
UNITED KINGDOM
k.reid@bas.ac.uk

Susan Waugh
NIWA
PO Box 8602
Christchurch
NEW ZEALAND
s.waugh@niwa.cri.nz

Henri Weimerskirch, member
Centre National de la Recherche Scientifique
Centre d'Etudes Biologiques de Chize
F-79360 Villiers-en-Bois FRANCE
henriw@cebc.cnrs.fr

Eric J. Woehler
Australian Antarctic Division
Channel Highway
Kingston
Tasmania 7050
AUSTRALIA
eric_woe@antdiv.gov.au

ANNEX 2

TABLED DOCUMENTS AT THE 1996 MEETING OF THE SCAR BIRD BIOLOGY-SUBCOMMITTEE

1. SCAR BIRD BIOLOGY SUBCOMMITTEE. Agenda for meeting in Cambridge, United Kingdom, 31 July–1 August 1996. 2 pp.
2. SCAR BIRD BIOLOGY SUBCOMMITTEE 1995. Scientific Committee on Antarctic Research Working Group on Biology Bird Biology Subcommittee. Minutes of meeting, 26–27 May 1994, Padua, Italy. *Mar. Orn.* 22: 253–268.
3. COOPER, J., PLÖS, A.L. & PHILLIPS, C.M. 1995. Publications and theses on Antarctic and sub-Antarctic birds, 1992. *Mar. Orn.* 23: 135–139.
4. PHILLIPS, C.M., WOEHLE, E.J. & COOPER, J. 1995. Publications and theses on Antarctic and sub-Antarctic birds, 1993. *Mar. Orn.* 23: 141–146.
5. WOEHLE, E.J., PHILLIPS, C.M. & COOPER, J. 1995. Publications and theses on Antarctic and sub-Antarctic birds, 1994. *Mar. Orn.* 23: 147–151.
6. PHILLIPS, C.M. ms. Publications and theses on Antarctic and sub-Antarctic birds, 1995. 11 pp.
7. PHILLIPS, C.M. ms. Publications and theses on Antarctic and sub-Antarctic birds, 1996. 3 pp.
8. KERRY, K. Communications on disease in birds. 21 pp.
9. FOWLER, G.S. Jugular venipuncture for the collection of blood samples from penguins. 2 pp.
10. CLARKE, J. ms. Blood sampling in penguins. 1 pp.
11. CROXALL, J.P., STEELE, W.K., McINNES, S.J. & PRINCE, P.A. 1995. Breeding distribution of the Snow Petrel *Pagodroma nivea*. *Mar. Orn.* 23: 69–100.
12. VAN FRANEKER, J.A., MEHLUM, F., VEIT R.R. & WOEHLE, E.J. ms. Distribution and numbers of the Antarctic Petrel *Thalassoica antarctica*. 18 pp.
13. VAN FRANEKER, J.A. 1996. Pelagic distribution and numbers of the Antarctic Petrel *Thalassoica antarctica* in the Weddell Sea during spring. *Polar Biol.* 14.
14. PATTERSON, D.L., CROXALL, J.P., WOEHLE, E.J., COOPER, J. & FRASER, W.R. ms. Breeding distribution and population status of the Northern Giant Petrel *Macronectes halli* and Southern Giant Petrel *M. giganteus*. 38 pp.
15. HODUM, P.J., CROXALL, J.P. & PONCET, S. ms. Breeding distribution of the Cape Petrel *Daption capense*. 19 pp.
16. SALLABERRY, M. & GONZALES, J. ms. How much do we know about the biology of Wilson's Storm Petrel? 9 pp.
17. NAVEEN, R. ms. Progress report on development of an Antarctic site inventory. 10 pp.
18. NAVEEN, R. ms. Antarctic site inventory. Summary of progress during two seasons of field work – 1994 to 1996. 2 pp.
19. NAVEEN, R. 1996. Antarctic site inventory: summary of progress during two seasons of field work – 1994 to 1996. XX ATCM/INF 102. 14 pp.
20. ANON. 1996. Photodocumentation of survey sites: report of a cooperative international program during the 1995–96 austral summer. XX ATCM/INF 100. 6 pp.
21. SCAR BIRD BIOLOGY SUBCOMMITTEE 1992. Status and trends of Antarctic and sub-Antarctic seabirds. In: Report of the Eleventh Meeting of the Scientific Committee. Hobart: Scientific Committee for the Conservation of Antarctic Marine Living Resources. SC-CAMLR-XI. pp. 443–461.
22. WOEHLE, E.J. 1996. Status and trends of Antarctic and sub-Antarctic seabirds, 1996. 30 pp.
23. GALES, R. in press. Albatross populations: status and threats. Appendix 1A-E. In: Robertson, G. & Gales, R. (Eds). Proceedings of the First Albatross Conference, Hobart, Australia, 1995. 6 pp.
24. BRIGGS, D.R. & HUMPIDGE, R. ms. Changes in breeding populations of Northern Giant Petrels *Macronectes halli* and Southern Giant Petrels *Macronectes giganteus* at Bird Island, South Georgia. 13 pp.
25. COOPER, J., WOLFAARDT, A.C. & CRAWFORD, R.J.M. ms. Trends in size and success of breeding colonies of Macaroni and Rockhopper Penguins at Marion Island, 19/80 to 1995/96. 22 pp.
26. WOEHLE, E.J. 1996. Concurrent decreases in five species of Southern Ocean seabirds in Prydz Bay. *Polar Biol.* 16: 379–382.
27. KERRY, K. 1996. CEMP monitoring methods. Letter to Dr P.D. Clarkson, Scientific Committee on Antarctic Research, 5 July 1996. 2 pp.
28. BOYD, I.L. 1996. Draft standard methods for attachment of instruments and the collection of data about at-sea behaviour. CCAMLR WG-EMM-METHODS-96/5. 8 pp.
29. CORIA, N.R., SOAVE, G.E. & MONTALTI, D. 1996. A methodological proposal to diet studies of the Cape Petrel, *Daption capense*. CCAMLR WG-EMM-METHODS-96/4. 8 pp.
30. CLARKE, J. 1996. CCAMLR Standard Method A8: Procedure A. CCAMLR WG-EMM-METHODS-96/9. 2 pp.
31. MEHLUM, F. & VAN FRANEKER, J.A. 1995. Draft standard methods for fulmarine petrels. a) Antarctic Petrel. CCAMLR WG-EMM-95/86. 8 pp.
32. VEIT, R. 1996. Using stomach lavage to sample diets of Procellariiformes. CCAMLR WG-EMM-METHODS-95/6. 2 pp.
33. IUCN SPECIES SURVIVAL COMMISSION 1994. IUCN Red List categories. Gland: International Union for Conservation of Nature and Natural Resources. 21 pp.
34. ELLIS, S. 1996. Draft taxon sheets for Antarctic and sub-Antarctic penguins. 32 pp.
35. JOUVENTIN, P. & WEIMERSKIRCH, H. ms. Proposed additions to the CAMP report. 4 pp.
36. SCAR GROUP OF SPECIALISTS ON SEALS 1993. Antarctic pack ice seals: indicators of environmental change and contributors to carbon flux. Cambridge: Scientific Committee on Antarctic Research. 12 pp.
37. SCAR GROUP OF SPECIALISTS ON SEALS 1994. Antarctic pack ice seals: indicators of environmental change and contributions to carbon flux. Cambridge: Scientific Committee on Antarctic Research. 8 pp.
38. SCAR GROUP OF SPECIALISTS ON SEALS 1995. APIS Antarctic pack ice seals. Report of the 1995 APIS Program planning meeting. APIS Report No. 1. 26 pp.
39. NIMON, A.J., SCHROTER, R.C. & OXENHAM, K.C. 1996. Artificial eggs: measuring heart rate and effects of disturbance in nesting penguins. *Physiol. Behav.* 60.
40. REINHARDT, K., PETER, H.-U. & WEMHOFF, H. ms. Southern Hemisphere skuas – where do they feed on

- what? 18 pp.
41. SCAR GROUP OF SPECIALISTS ON ENVIRONMENTAL AFFAIRS AND CONSERVATION. Draft report of the eighth meeting, GOSEAC VIII, held in Puerto Iguazu, Argentina, 17–22 June 1996. 36 pp.
 42. PRINCE, P.A. & CROXALL, J.P. 1996. The birds of South Georgia. *Bull. Br. Orn. Club* 116: 81–104.
 43. Agenda, SCAR Ad-hoc Working Group on Seabirds at Sea Methodology. Cambridge. 1 pp.
 44. WOEHLE, E.J. 1995. Scientific Committee on Antarctic Research Bird Biology Subcommittee (SCAR-BBS) Ad-hoc Working Group on Seabirds at Sea Methodology. Minutes of the workshop held in Glasgow, 26 & 27 March 1995. 37 pp.
 45. SPEAR, L.B., AINLEY, D.G., HARDESTY, D., HOWELL, S.N.G. & WEBB, S. ms. Comparison of methods for censusing seabirds at sea, and suggestions for improvement. 40 pp.
 46. SPEAR, L.B., RIBIC, C.A. & AINLEY, D.G. ms. Validation analyses of at-sea censuses as a means to estimate size of seabird populations. 34 pp.
 47. SPEAR, L.B. & AINLEY, D.G. in press. Flight behaviour of seabirds in relation to wind direction and wing morphology. *Ibis*. 41 pp.
 48. SPEAR, L.B. & AINLEY, D.G. in press. Flight speed of seabirds in relation to wind speed and direction. *Ibis*. 26 pp.
 49. Workshop agenda. Workshop on Alternative Penguin Marking Techniques. 30 July 1996, British Antarctic Survey, High Cross, Madingley Road, Cambridge. 1 pp.
 50. CLARKE, J. & KERRY, K.R. 1996. Implanted identification tags in penguins: implantation methods, tag reliability and long-term effects. CCAMLR WG-EMM-METHODS-96/8. 14 pp.
 51. KLAGES, N.T.W. & SPENCER, K.D. in press. Flipper bands on penguins: why newer is not always better. *SAFRING News*. 7 pp.
 52. HINDELL, M.A., LEA, M.-A. & HULL, C.L. 1996. The effects of flipper bands on adult survival rate and reproduction in the Royal Penguin, *Eudyptes schlegeli*. *Ibis* 138: 557–560.
 53. FRASER, W.R. & PATTERSON, D.L. 1996. Scientific Committee on Antarctic Research Bird Biology Subcommittee (SCAR-BBS) minutes of the Workshop on Alternative Penguin Marking Techniques held in Cambridge, 30 July 1996. 3 pp.

ANNEX 3

SCIENTIFIC COMMITTEE ON ANTARCTIC RESEARCH BIRD BIOLOGY SUBCOMMITTEE (SCAR-BBS) MINUTES OF THE WORKSHOP ON ALTERNATIVE PENGUIN MARKING TECHNIQUES HELD IN CAMBRIDGE, 30 JULY 1996

WILLIAM R. FRASER, CONVENER
DONNA L. PATTERSON, RAPPORTEUR

1. OPENING REMARKS AND AGENDA

The workshop was opened on 30 July at 09h00 by W.R. Fraser at the British Antarctic Survey headquarters. The 23 attendees present (Appendix 1) were introduced and advised of changes in the agenda. The agenda consisted of six morning presentations and an afternoon discussion (Doc. 49).

2. WORKSHOP BACKGROUND

At the Workshop on Seabird-Researcher Interactions held in the United States on 15-17 July 1993, data were presented that suggested that flipper bands may have undesirable effects on penguins. As a result, the recommendation was made that alternative marking techniques without the drawbacks inherent in flipper bands should be investigated by researchers currently working on penguins. This recommendation was subsequently addressed at the SCAR-BBS meeting held in Padua, Italy during May 1994. SCAR-BBS members agreed that it would be desirable to address this topic formally as part of a workshop to be held in conjunction with the SCAR-BBS meetings in Cambridge during July 1996.

The Workshop on Seabird-Researcher Interactions recognized the desirability of having permanent markers to distinguish

penguins and identified several new and emerging technologies with the potential to meet these objectives without the apparent undesirable effects evident in bands. These included several types of transponders, a nylon tag presently used to mark fish and commercial bar codes. This workshop also recognized the value of linking the experience of researchers involved with wild populations with current practitioners from manufacturing companies, zoological gardens and animal husbandry. The broad focus and objectives of the Cambridge workshop were thus to 1) examine what alternative technologies were currently in use for marking penguins, and 2) bring together the joint experience of a diverse group of investigators to evaluate potential methodologies.

3. ALTERNATIVE MARKING TECHNIQUES BASED ON INTERNAL APPLICATIONS

E.J. Woehler presented an overview on the use of implanted transponders on behalf of J. Clarke and K.R. Kerry, Australian Antarctic Division (Doc. 50). Workshop participants agreed that implanted transponders currently offer one of the most promising alternatives for individually marking penguins, as these instruments neither produce the undesirable effects of bands nor appear to compromise survival. However, participants also agreed that before the use of transponders became

widespread, it would be desirable to address several issues. These included risks from infection, transponder migration after implantation and/or accidental injection into muscle tissues, transponder rejection, transponder detection ranges and the need to identify penguins carrying transponders to diminish the risk of double-tagging.

In discussing these issues, participants were able to recommend several alternatives to minimize the identified risks. In the case of infections, it was suggested that each implant be done with a different, as opposed to the same, sterile needle. Transponder migration and rejection, on the other hand, appears to be due in part to the choice of injection site, with the neck and shoulder regions being less desirable. Transponders injected into the upper thigh or leg show little or no further movement and tag rejection can be greatly minimized by insuring that the opening created by the needle is above rather than below the transponder. In regard to the issue of limited detection ranges (currently at about 600 mm), participants felt that improvements in technology or more advanced transponders (e.g. tags based on microwave technologies) were clearly needed, and cautioned that trying to find birds carrying transponders may create a level of disturbance high enough potentially to cancel out the benefits derived from this application. Participants agreed that use of this application may be optimized by using automatic detection devices and fencing or gating areas to force birds through a detection zone. The issue of how to identify externally penguins carrying transponders is further discussed below.

4. ALTERNATIVE MARKING TECHNIQUES BASED ON EXTERNAL APPLICATIONS

Aspects of the history of marking penguins in the Antarctic using externally mounted devices and bands in particular were reviewed by B. Stonehouse. Related presentations concerning the effects of banding and/or the use of alternative marking devices were given by G. Froget, W.R. Fraser and J. Cooper. Two recent papers on the subject were also tabled and discussed (Docs 51 & 52). The consensus among the participants regarding these applications was that a multi-year mark to identify penguins individually was clearly needed, but flipper bands should no longer be recommended as the method of choice. Participants subsequently discussed four external marking methods: leg bands, fish tags, bar codes and generic markers such as web punches or tattoos.

With the exception of fish tags and bar codes, it was agreed that the other methods share a common problem in that they are difficult to detect in most penguins and would thus offer limited use as a research tool. Some, such as tattoos and web punches, also carry the additional risk of injury or infection. Nevertheless, participants noted that some long-term studies on penguins had successfully employed one or more of these methods, leg bands in particular, suggesting that under some conditions skilled practitioners could use these tools effectively. Training was thus emphasized as a prerequisite to using these applications and experimentation was encouraged. G.L. Kooyman related that he intends to begin experimenting with leg bands on Emperor Penguins *Aptenodytes forsteri* in captivity and would report his results to the convener as soon as they were available.

L.S. Davis was the only participant with some experience using bar codes, although research is at the moment too pre-

liminary to offer any conclusions. The workshop encouraged further work on this application. The use of fish tags as an external marker was reviewed by W.R. Fraser based on recent experiments at Palmer Station, Antarctic Peninsula, on Adélie Penguins *Pygoscelis adeliae*. These markers offer several advantages in that they are highly visible, inexpensive and with practice can be applied faster than conventional flipper bands. Within-season retention of the tag is also comparable to that of flipper bands. The disadvantage in using these tags relate exclusively to between-season retention, which in the experiments discussed was less than 10%. Part of the problem is specific to tag construction in that the nylon thread holding the anchor may be too fragile. Further experiments are planned using a more robust thread. This tag was regarded as a good alternative to flipper bands for short-term studies but not as a long-term marking device.

The consensus expressed by the participants regarding the use of flipper bands was reached after reviewing several lines of evidence, some, it must be pointed out, not entirely negative. For example, at least two studies in which long-term banding has taken place, one in Argentina (Magellanic Penguin *Spheniscus magellanicus*) and the other in South Africa (African Penguin *S. demersus*), report high (75-95%) return rates in banded birds. These studies suggest that flipper bands have limited to negligible effects on these species and are not regarded as an important source of mortality. In contrast, controlled experiments on Possession Island with King Penguins not only suggest that flipper-banded birds suffer greater mortality, but that marked, returning birds breed later and experience poor reproductive success. Similar trends were, however, not recorded in other regions (e.g. South Georgia) where King Penguins had been had also been flipper banded.

In considering the implications of these results, participants agreed that the overall evidence warranted the expression of a highly cautionary approach to the use of flipper bands. At the same time, however, the workshop identified several confounding variables that should be investigated as a means of securing more definitive information on the possible source of the variability between studies. Workshop participants noted, for example, that different species exhibited different responses to flipper banding, that in many cases the bands used involved different metals or grades of metals and that techniques used to apply bands varied between banding schemes and investigators. Workshop participants agreed that these variables should be investigated as a prerequisite to addressing future actions.

5. RECOMMENDATIONS

The workshop noted that the Third International Penguin Conference would be taking place in Cape Town, South Africa in September 1996, and that it would prudent to capitalize on this conference to investigate further the issues discussed. Three recommendations were thus agreed upon:

- a. An expanded version of this report would be produced, circulated among the participants for comments and tabled at the conference.
- b. Coincident with this effort it was agreed that a detailed questionnaire should be developed to compile data on
 - 1) the materials, construction and dimensions that characterize products currently in use to mark penguins;

- 2) methods of application; and
 3) results and/or problems associated with the marking schemes.
- c. Dr. W.R. Fraser undertake execution of these recommendations with the objective of delivering a synthesis to the SCAR Bird Biology Subcommittee by the time of its next meeting.

6. CLOSURE AND ACKNOWLEDGEMENTS

The workshop adjourned at 17h00. Financial assistance from SCAR to facilitate the workshop and from the British Antarctic Survey for providing excellent facilities and support were gratefully acknowledged.

APPENDIX 1

NAMES AND ADDRESSES OF PARTICIPANTS

David G. Ainley
 H.T. Harvey & Associates
 P.O. Box 1180, Alviso
 California 95002
 USA

Simon Blackwell
 Cotswold Wildlife Park
 Burford, Oxfordshire OX18 4JW
 UNITED KINGDOM

John Cooper

Nestor R. Coria

John P. Croxall

Lloyd S. Davis

Jan A. van Franeker

Mike D. Francis
 Francis Scientific Instruments
 160 Caxton End, Bourn, Cambridge CB3 7ST
 UNITED KINGDOM

William R. Fraser

Guillaume Froget
 Centre d'Ecologie et Physiologie Energitique
 Centre National de la Recherche Scientifique
 23 rue Becquerel, 67087 Strasbourg
 FRANCE
 froget@c-strasbourg.fr

Peter Hodum

Pierre Jouventin

Gerald L Kooyman

Juan Moreno

Olof Olsson
 Department of Zoology
 University of Uppsala
 Villavagen 9, S-75236 Uppsala
 SWEDEN
 olof.olsson@zoologi.uu.se

Donna L. Patterson

Peter A. Prince

Keith Reid

Christine Ribic
 NBS-Wisconsin Cooperative Wildlife Research Unit
 University of Wisconsin, 226 Russell Laboratories
 Madison
 Wisconsin 53706
 USA
 caribic@facstaff.uwisc.edu

Larry B. Spear
 H.T. Harvey & Associates
 P.O. Box 1180
 Alviso
 California 95002
 USA

Miranda Stevenson
 Edinburgh Zoological Gardens
 Corstorp
 Edinburgh
 EH12 6TS
 UNITED KINGDOM
 hfs@tattoo.ed.ac.uk

Bernard Stonehouse
 Scott Polar Research Institute
 University of Cambridge
 Lensfield Road
 Cambridge CB2 1ER
 UNITED KINGDOM
 BS111@cus.cam.ac.uk

Susan Waugh

Henri Weimerskirch

Eric J. Woehler

Euan C. Young
 c/o School of Biological Sciences
 University of Auckland
 Private Bag
 Auckland
 NEW ZEALAND