

DEPENDENT SPECIES

Species Monitored in the CCAMLR Ecosystem Monitoring Program (CEMP)

Dependent Species

Report of WG-EMM

3.1 Dr Everson introduced those sections of the WG-EMM report dealing with dependent species and with species specifically studied under the CCAMLR Ecosystem Monitoring Program (CEMP).

3.2 Activities at current CEMP sites and proposed activities are described in Annex 4, paragraphs 4.1 to 4.10.

3.3 No proposals had been received suggesting incorporation of new species into the CEMP monitoring program.

3.4 The Subgroup on Monitoring Methods had met in Bergen, Norway, under the Convenership of Dr Kerry, immediately prior to the meeting of WG-EMM. The full report of the subgroup is contained in Annex 4, Appendix I.

3.5 The Scientific Committee noted that WG-EMM approved the following new methods (Annex 4, paragraph 4.26):

- (i) attachment of instruments;
- (ii) data collection using TDRs; and
- (iii) monitoring methods for petrels which include methods for the collection and analysis of chick diet in cape and Antarctic petrels and monitoring population size, breeding success, recruitment and adult survival rate in Antarctic petrels.

These are now recommended by the Scientific Committee for publication in the *CEMP Standard Methods*.

3.6 The Scientific Committee also noted that WG-EMM approved the following initiatives which were the subject of advice from the Subgroup on Monitoring Methods (Annex 4, paragraph 4.54):

- (i) develop additional new methods for Antarctic and Cape petrels, especially those for breeding chronology;
- (ii) request a study of the effects on birds of using warm or fresh water for stomach lavage;
- (iii) request the Subgroup on Statistics to consider analysis of predator foraging performance data based on studies of at-sea behaviour;
- (iv) maintain close links with APIS; and
- (v) add advice on appropriate methods for the collection of samples for toxicological and pathological analysis as an appendix to the *CEMP Standard Methods*.

3.7 The Scientific Committee thanked Dr Kerry and the subgroup for their work. It noted that with a new edition of the *CEMP Standard Methods* in preparation, the Subgroup on Monitoring Methods will not need to meet next year. Until further notice, proposals for new methods should be submitted directly to WG-EMM.

3.8 At its 1995 meeting, WG-EMM highlighted several areas in which the analysis and presentation of data from CEMP could be improved and extended. These include:

- (i) the calculation of indices of dependent species parameters and, in particular, the need for an improved method to identify anomalous years; and
- (ii) extension of indices to cover harvested species and environmental parameters; and
- (iii) improve the way in which the data are presented.

3.9 These issues were referred to the Subgroup on Statistics for consideration during the intersessional period. That subgroup had met, under the convenership of Dr Agnew, in Cambridge, UK, from 7 to 9 May 1996 and the report is included as Appendix H to Annex 4.

3.10 The subgroup is currently developing a new method to identify anomalous years in time series of indices of dependent species parameters (Annex 4, paragraph 4.57). Although this is a considerable improvement on previous methods, this method still fails to identify anomalies for all years where these would have been expected (Annex 4, paragraph 4.60).

3.11 WG-EMM recommended that anomalies should be interpreted with caution at this stage (Annex 4, paragraph 4.68) and recommended that questions relating to the statistical definitions of anomalies in parameters should receive further attention (Annex 4, paragraph 4.76).

3.12 Summary presentations of CEMP indices and data held in the Secretariat database were presented in WG-EMM-96/4. There was considerable discussion on the content, presentation and interpretation of data leading to a revised form of presentation given in Annex 4, Table 4.

3.13 Table 4 in Annex 4 is a presentation of normal deviates of the indices (derived through statistical analysis of the CEMP data), so that it is halfway between the previous qualitative, and somewhat subjective, presentation of data in last year's report (SC-CAMLR-XIV, Annex 4, Table 3) and a future quantitative presentation of anomalies.

3.14 The Scientific Committee noted with satisfaction this significant development in the analysis and presentation of the CEMP indices.

3.15 Dr Croxall suggested that Members should be encouraged to update CEMP Tables 1 to 3 (SC-CAMLR-XV/BG/2 Rev. 1) on an annual basis, since these tables provide a very useful conspectus of which data are actually in the database and also provide the most convenient way for the Scientific Committee to understand the status of data collection and submission in respect of the monitoring indices. The Scientific Committee endorsed this suggestion.

3.16 The Scientific Committee expressed its appreciation to Members for the very substantial effort that had been put into the submission of data and to Dr Agnew for the compilation of data in the CEMP database. It also thanked Dr Agnew for organising the Subgroup on Statistics and leading a very stimulating and profitable discussion.

3.17 Directed research studies on diet, foraging activities and population dynamics of dependent species were discussed in Annex 4, paragraphs 4.80 to 4.93.

Proposals for Extension of the Scope of CEMP

3.18 There were no proposals to extend the scope of CEMP.

Proposals for CEMP Site Protection

3.19 No specific proposals for CEMP site protection were made at the meeting.

3.20 The Scientific Committee noted that Norway will be establishing a CEMP monitoring site at Bouvet Island during the forthcoming season.

Data Requirements

3.21 There is a continuing request (Annex 4, paragraph 7.58(xii)) for all appropriate data on CEMP indicator species currently held by Members and which have not yet been submitted, including historical datasets, to be compiled and submitted in CCAMLR formats.

Assessment of Incidental Mortality

Incidental Mortality in Longline Fisheries

Intersessional Work

3.22 The Scientific Committee noted with appreciation the substantial intersessional work coordinated and undertaken by the Secretariat in conjunction with ad hoc WG-IMALF (WG-FSA-96/32). The following actions, and matters arising therefrom, were specifically noted:

- (i) Members are requested to suggest appropriate changes to the membership of ad hoc WG-IMALF; the additions specified in Annex 5, paragraph 7.2 were endorsed;
- (ii) thanks to all involved in the production of the book *Fish the Sea Not the Sky* and especially to Australia for the generous additional funds permitting translation into all four languages of the Commission (Annex 5, paragraph 7.5);
- (iii) the Commission is requested to distribute this book to priority recipients (Annex 5, paragraph 7.6) and to undertake appropriate further distribution and evaluation (Annex 5, paragraphs 7.7 to 7.10). Further development and dissemination of the message contained in this book should be investigated (Annex 5, paragraph 7.8);
- (iv) the costed proposal from New Zealand for a seabird identification manual (CCAMLR-XV/13), prepared in response to requests in previous CCAMLR reports (CCAMLR-XIV,

paragraph 5.29(xi); SC-CAMLR-XIV, paragraph 3.28(iii)); the Scientific Committee endorsed the support by WG-FSA as set out in Annex 5, paragraph 7.13;

- (v) the response from SCAR to requests for information on means of determining the origin of birds caught in longlines (Annex 5, paragraph 7.14);
- (vi) responses to a request for information on existing and proposed monitoring of albatross, giant petrel and white-chinned petrel populations from Australia, UK, New Zealand and South Africa; similar information is awaited from France (Annex 5, paragraphs 7.15 to 7.18); and
- (vii) production and circulation of the Scientific Observer Logbook (Annex 5, paragraphs 7.19).

3.23 Detailed responses were received from New Zealand (Annex 5, paragraph 7.23) and Norway (Annex 5, paragraph 7.24) in respect of the request for information on work to develop and test systems for releasing baited longlines underwater.

3.24 Based on the Norwegian experiences in the North Atlantic and observations by Chilean scientists in the South Atlantic (reported by Prof. C. Moreno), it was clear that the existing Mustad design needs substantial modification (e.g. increases to the length of the setting funnel and/or more weight on the line) to prevent the line surfacing after setting.

3.25 The Scientific Committee reaffirmed the importance of further work on underwater setting techniques and encouraged all Members with relevant information to make this widely available in order to assist in the development of more effective devices, especially those for use with the Spanish method of longlining.

3.26 The Scientific Committee noted that further analysis of the 1995 data from the Scientific Observer Program had been postponed due to lack of time and resources in the Secretariat during the intersessional period.

Data from 1996 Scientific Observer Program: Subarea 48.3

3.27 Because data from observers were generally submitted late and often in formats different from those specified by CCAMLR (Annex 5, paragraphs 7.27 to 7.30), analysis of data provided by observers had so far been possible for only three vessels.

3.28 Several Members noted that they had only received CCAMLR logbooks after their observers departed to sea in March and that this had greatly complicated and delayed the submission of data to CCAMLR. It was stressed that the revised logbook, to be available in all languages of the Commission, needed to be provided directly and promptly to those who needed to use them. This and other issues relating to the efficient conduct of the International Scheme of Scientific Observation, and especially to the collection and submission of data, are summarised in paragraphs 9.7 to 9.11.

3.29 Data collected by the three scientific observers, supplemented by their reports, indicated that a total of about 150 birds were observed killed (and another 66 released alive) with catch rates ranging from 0.02 to 0.72 birds/1 000 hooks. Most birds, and especially albatrosses, were caught during daytime (39% of all sets); white-chinned petrel was the main species caught at night.

3.30 When these catch rates are extrapolated to all longline sets of all 16 vessels in the fishery in Subarea 48.3, the resulting estimate is that about 2 300 seabirds (65% albatrosses, mainly black-browed albatrosses) were caught, of which 1 618 were killed (Annex 5, paragraph 7.40). The C2 forms submitted by nine vessels give a total of 709 birds killed, which would extrapolate to a total mortality of about 1 260 birds.

3.31 Concern was expressed that these estimates assume that data for three vessels are representative of the whole fishery. More accurate data, however, will only be available once analysis of the full dataset is completed intersessionally.

3.32 Dr A. Baker (New Zealand) noted that a substantial proportion of albatrosses (20%) and shearwaters and petrels (52%) had not been identified to species by the observers, indicating a clear need for the proposed identification manual (see paragraph 3.22(iv)). Members agreed that there was a need to develop the skill and knowledge of observers to enable accurate identification of the seabirds killed in order to improve the quality of data on by-catch provided to the Commission and thus support its conservation measures relating to incidental mortality.

3.33 The Scientific Committee endorsed the main conclusions of WG-FSA (Annex 5, paragraphs 7.51 and 7.84) in respect of the analyses of the 1996 observer data undertaken so far, i.e.:

- (i) the number of seabirds, especially black-browed albatrosses, being caught is a matter of serious concern;
- (ii) daytime setting is the major contributor to these high catch rates, especially of albatrosses; discharge of offal on the same side of the vessel as the haul is also

contributing. Both practices increase interactions with birds and result in decreased fishing efficiency; and

- (iii) the Commission should request Members to take all appropriate steps to ensure compliance with all aspects of Conservation Measure 29/XIV, thereby achieving a substantial reduction in seabird by-catch and more cost-effective fishing.

3.34 Several Members raised concerns that information from logbook data and/or reports from scientific observers were being transmitted to SCOI as evidence of infractions of conservation measures. It was agreed that the greatest care should be taken to keep separate the roles of scientific observer and CCAMLR inspector.

Seabird By-catch Data from Division 58.5.1

3.35 The Scientific Committee noted the results of an experimental study by France testing the effectiveness of mitigating measures to reduce seabird by-catch (Annex 5, paragraphs 7.53 and 7.54). The CCAMLR specification of streamer line was less effective than expected, possibly due to sea conditions, and further study is needed. Nevertheless, relatively few albatrosses were caught, 86% of the 529 birds reported being white-chinned petrels. Although offal discharge did produce significantly lower by-catch rates, the continuation of this practice is not recommended because it attracts more birds to the vicinity of the vessel.

Data from Outside the Convention Area

3.36 The Scientific Committee thanked New Zealand, UK, Australia and France for providing information on seabird by-catch and the use of mitigating measures in areas adjacent to the Convention Area. The Scientific Committee endorsed the conclusions of WG-FSA (Annex 5, paragraph 7.63) that these reports:

- (i) show that by-catch of albatrosses breeding in the Convention Area is prevalent in waters outside the Convention Area;
- (ii) indicate that streamer lines of CCAMLR specification are effective in reducing by-catch; and
- (iii) contain methods of analysis of by-catch data of relevance to CCAMLR.

The Scientific Committee also noted with approval that the use of mitigating measures similar to those required by CCAMLR is now mandatory in two areas adjacent to the Convention Area (Falkland/Malvinas Islands and Australian Fishing Zone south of 30°S).

3.37 The Scientific Committee welcomed the establishment by CCSBT of a Working Group on Ecologically Related Species (ERS) which had considered issues of fishery-seabird interactions; it endorsed WG-FSA's comments on the following matters:

- (i) the suggestion relating to closer liaison between CCAMLR and CCSBT-ERS (Annex 5, paragraph 7.67(iv) to (vi));
- (ii) the encouragement to CCSBT to implement provisions to reduce by-catch of seabirds in regions adjacent to the Convention Area (Annex 5, paragraph 7.67(iii)); and
- (iii) the hope that other conventions regulating longline fisheries would establish groups to tackle the problems of seabird-longline fishery interactions (Annex 5, paragraph 7.68).

3.38 Mr H. Moronuki (Japan) expressed concern that:

- (i) while acknowledging the content of Annex 5, paragraph 7.67, CCAMLR should not prejudge the work of the CCSBT-ERS Working Group; and
- (ii) it was necessary for CCAMLR to concentrate primarily on problems in the Convention Area rather than on seabird-fishery interactions outside the Convention Area, especially given the potential start of many new longline fisheries within the Convention Area.

3.39 Many Members noted that, for albatross species and white-chinned petrels breeding in the Convention Area, interactions with fisheries during their breeding season mainly occur within the Convention Area (except for wandering albatrosses), whereas throughout the rest of the year most interactions occur with fisheries outside the Convention Area. (This has been a concern expressed by CCAMLR over the last several years and is further supported by data presented at the present meeting, e.g. WG-FSA-96/8 (Annex 5, paragraph 7.70), WG-FSA-96/9 (Annex 5, paragraph 7.65) and WG-FSA-96/62, 96/63, 96/64 and 96/65 (Annex 5, paragraphs 7.59 to 7.61)). Furthermore, CCAMLR has introduced and implemented strict conservation measures (Conservation Measure 29/XIV) designed to reduce incidental mortality; all Members proposing new longline fisheries in the Convention Area have indicated that they will abide by these provisions. Therefore it is only natural that CCAMLR

should express particular concern about the potential impact on birds from the Convention Area of fisheries adjacent to the Convention Area where the use of mitigating measures is not a requirement.

3.40 It was further noted that:

- (i) much of the original work to develop appropriate mitigating measures had been initiated by Japanese fishermen (and subsequently developed in conjunction with Australian scientists) and that this had provided the basis for CCAMLR's provisions; and
- (ii) CCAMLR not only wished to encourage Japan which now contributes only about 44% of the estimated tuna longline effort south of 30°S (WG-FSA-96/65) to continue to use and develop improved mitigating measures, but also to encourage other fishing nations to use measures to reduce seabird by-catch in as widespread a manner as they were understood to be used within the Japanese fishery.

Issues Relevant to Fishery Management

3.41 The Scientific Committee noted the new data concerning the overlap between the foraging ranges of albatrosses breeding on South Georgia and the locations of longline fishing operations in Subarea 48.3 (Annex 5, paragraphs 7.69 and 7.70) and endorsed the conclusions of WG-FSA that substantial reductions in incidental mortality of albatrosses would be achieved by delaying the start of longline fishing in Subarea 48.3 until 1 May (Annex 5, paragraph 7.71).

3.42 However, the Scientific Committee also noted that although no Member had explicitly provided any information on the consequences of delaying fishing in Subarea 48.3 until 1 May (as requested by the Scientific Committee last year), several concerns had been expressed at the meeting relating to fishing efficiency and the consequences of increasing fishing effort during the *D. eleginoides* spawning season. Other concerns raised included the consequences for stock assessment work of changing the timing of the fishery.

3.43 There were diverse opinions on the likely significance of any problems that would be caused by the fishery being conducted from May to September, but there was agreement that this should be investigated by WG-FSA as a matter of priority.

3.44 Aspects to be investigated intersessionally, once all current observer data are available, are the consequences of changing the season of the longline fishery for *D. eleginoides* in Subarea 48.3 to May through September for:

- (i) recruitment to the stock;
- (ii) fishing efficiency (including analysis of CPUE data when available); and
- (iii) the ability to undertake appropriate and timely stock assessment, especially including the use of the generalised linear model (GLM).

3.45 It was recognised, however, that, compared with last year, there is now more information on the potential benefits, in terms of reducing albatross by-catch, to be gained by delaying longline fishing in Subarea 48.3 until 1 May. It was therefore essential to undertake critical evaluation, on the basis of the best data currently available, of the implications of changes to the fishing season before the next meeting of the Scientific Committee.

3.46 For the time being therefore, it was agreed that the Scientific Committee could only reiterate to the Commission its advice of last year, viz. that on the understanding that there would be full compliance with Conservation Measure 29/XIV, it recommended the retention of the fishing season of 1 March to 31 August for 1996/97.

3.47 The Scientific Committee endorsed other recommendations of WG-FSA concerning:

- (i) the value of the International Scheme of Scientific Observation, suggested improvements to this scheme and the need to continue 100% observer coverage within all longline fisheries (Annex 5, paragraphs 7.80 to 7.82);
- (ii) the high priority of continuing the work of the Scientific Observer Data Analyst, particularly given the volume of observer data that remains to be analysed intersessionally and that envisaged to be provided under the projected new fisheries (Annex 5, paragraph 7.89); and
- (iii) the retention of Conservation Measure 29/XIV in its present form, subject to a minor revision to define precisely the meanings of the terms 'nautical twilight' and 'dawn'.

3.48 The need for this revision was indicated by Dr Miller, who drew the Scientific Committee's attention to potential difficulties that may arise from different interpretations of the definition of time contained in paragraph 2 and footnote 4 of Conservation Measure 29/XIV.

3.49 The Scientific Committee agreed that, as a practical guide, 'nautical twilight' ends or begins when it is too dark to see the horizon clearly. 'Nautical twilight' is defined as the instant where the centre of the sun is at a depression angle of twelve degrees (12°) below an ideal horizon. These times are obtainable from Nautical Almanac tables for the relevant latitude, local time and date.

3.50 All times, whether for ship operations or observer reporting, must be recorded with reference to GMT. For example, a vessel keeping its own time must ensure that the times set by the Nautical Almanac (as per paragraph 3.49 above) are referenced to the GMT time-zone in which the vessel is operating.

3.51 The Scientific Committee agreed that footnote 4 should remain with the term 'dawn' being replaced by 'sunrise'.

3.52 To assist vessels to implement this element of Conservation Measure 29/XIV, the Scientific Committee requested the Secretariat to provide a table indicating approximate times of nautical twilight for the appropriate parts of the Convention Area on a basis to be determined by the Scientific Observer Data Analyst in conjunction with interested Members.

3.53 The Scientific Committee noted that the details of future work on IMALF issues would be summarised within a proposal for a program of intersessional work, as done last year (Annex 5, paragraph 7.1). This would include the requirement that next year the IMALF subgroup should commence work at the start of the meeting of WG-FSA.

3.54 The Scientific Committee also noted:

- (i) the draft report of the Workshop (held in Hobart in September 1995) on Incidental Mortality of Albatrosses Associated with Longline Fishing (SC-CAMLR-XV/BG/20). This report was tabled to give Members an opportunity to comment (in writing to the editors) on any matters of interest or concern before the text is finalised in late 1996 for circulation to workshop participants for final approval;
- (ii) the text of the draft resolution to the General Assembly of IUCN (meeting in Montreal, Canada in October 1996) on seabird by-catch in longline fisheries (CCAMLR-XV/BG/10) which included commendation of the recent initiatives by CCAMLR to reduce seabird by-catch;

- (iii) the report by Chilean observers of the death of one Weddell seal and one Antarctic fur seal due to entanglement during longline fishing for *D. eleginoides* in Subarea 48.3 in 1996 (Annex 5, paragraph 8.3); and
- (iv) data from 1996 on the impact of marine mammals on longline fisheries for *D. eleginoides*, indicating considerable loss of fish to Antarctic fur seals in Division 58.5.1 and to killer whales (orca) in Subarea 48.3 (Annex 5, paragraphs 5.18 to 5.23).

Incidental Mortality in Trawl Fisheries

3.55 Prof. Duhamel noted that practically no incidental mortality has been observed in the trawl fishery in Division 58.5.1 since the ban on the use of netsonde cables came into effect (Annex 5, paragraph 8.2). Recognising that the French trawl fishery catch currently accounts for 40% of the total reported catches of *D. eleginoides* in Division 58.5.1, this ban makes a major contribution to reducing the incidental mortality of birds in this fishery as compared to the longline fishery. This should be taken into account in management advice to the Commission.

Marine Debris

3.56 In respect of the entanglement of Antarctic fur seals in marine debris at South Georgia, Dr Croxall introduced SC-CAMLR-XV/BG/3, summarising all data reported by the UK to CCAMLR from 1989 to 1994, and SC-CAMLR-XV/BG/5, reporting the results of the most recent surveys at Bird Island, South Georgia in winter 1995 and summer 1996. These latter data indicate that the latest entanglement rates in the study population were the highest since 1993, with eight fur seals entangled in the 1995 winter and 34 in the 1996 summer. Of additional concern were the first records of seals entangled in packaging bands in winter since 1993 and the increased proportion of entanglements in summer in fishing nets and packaging bands (despite the use of the latter on fishing vessels being prohibited in the Convention Area since the start of the 1995/96 summer under Conservation Measure 63/XII). It is not unlikely that these increases reflect the increased levels of fishing activity in Subarea 48.3 and particularly by vessels not operating under the auspices of CCAMLR and therefore unlikely to be complying with Conservation Measure 63/XII.

3.57 In response to a question from Prof. Moreno, Dr Croxall noted that, although the number of seals observed entangled at Bird Island nowadays was only about one-sixth of the values in 1989,

because the South Georgia fur seal population had doubled since then, the number of seals entangled annually in the whole population was probably at least in the order of 2 000 animals.

3.58 In CCAMLR-XV/BG/6 the UK also reported the entanglement of a southern elephant seal in a packaging band and seven Antarctic fur seals in fishing nets and longline material at Bird Island, South Georgia in 1996. SC-CAMLR-XV/BG/4 notes that a gentoo penguin chick was released from entanglement in a (cut) packaging band at Bird Island in 1996.

3.59 In CCAMLR-XV/BG/26 the USA reported one Antarctic fur seal entangled in synthetic cord, part of an Antarctic fur seal pup entangled in a packaging band at Seal Island, South Shetland Islands, and a southern giant petrel with a longline hook embedded in its throat near Palmer Station, Antarctic Peninsula in 1996.

3.60 Prof. D. Torres (Chile) introduced SC-CAMLR-XV/BG/27 which reports observations of four Antarctic fur seals (two juveniles and two pups) entangled in fishing net and packaging bands at Cape Shirreff, South Shetland Islands in 1996. Although the packaging band had originally been cut, it had subsequently been tied into a loop before disposal. Chilean scientists have been able to publicise these data to national and international audiences, thereby increasing awareness of CCAMLR's work in this field and of the need to continue to improve practices relating to the disposal of waste from fishing vessels at sea in the Southern Ocean, as indicated in SC-CAMLR-XV/BG/27.

3.61 Mr Moronuki advised that all Japanese krill fishing vessels are equipped with incinerators for burning waste material such as plastics and net gear and that there were no reports of fishing gear lost from Japanese vessels in 1996.

3.62 Dr Croxall summarised SC-CAMLR-XV/BG/4, which reports three observations of oiled seabirds (wandering albatross, snow petrel) at Bird Island, South Georgia and presents the results of the third (1996) standardised survey of man-made debris associated with breeding seabirds. The incidence of marine debris, especially fishing gear, associated with breeding albatrosses had returned to the high levels of 1994. The fishing gear included a squid jig decoy associated with a grey-headed albatross nest. Given the known foraging range of breeding grey-headed albatrosses it is highly likely that the jig was acquired within the Convention Area, suggesting that squid fishing might have occurred between October 1995 and March 1996 in, or very near, the Convention Area. Many fishing hooks, all identical to those used in the *D. eleginoides* longline fishery, were recorded from pellets regurgitated by wandering albatrosses; four adult and two chick wandering albatrosses and one adult black-browed albatross were observed with ingested or impaled hooks with fishing line attached.

3.63 There was general concern over the problems posed by loss of fishing gear, especially hooks. It was noted that WG-FSA-96/57 had estimated that about 100 000 hooks are lost annually by the *D. eleginoides* fishery in Subarea 48.3 and that the loss of sections of line and hooks remaining in fish heads thrown overboard poses threats to marine life, especially seabirds (Annex 5, paragraphs 8.5 and 8.6).

3.64 The attention of the Commission was drawn to the concerns over increases in the amount of marine debris in 1996, especially that originating from fishing vessels in the Convention Area.

Advice to the Commission

3.65 The Scientific Committee recommended that the Commission:

- (i) distribute the book *Fish the Sea Not the Sky* as widely and appropriately as possible (paragraph 3.22(iii));
- (ii) encourage further work to develop effective devices for underwater setting of longlines (paragraph 3.25);
- (iii) provide the revised edition of the Scientific Observer Logbook, in all languages of the Commission, as quickly as possible to those who need to use it (paragraph 3.28);
- (iv) note the conclusions of the Scientific Committee based on the analysis of the available data on seabird by-catch in the *D. eleginoides* longline fishery in Subarea 48.3 in 1996 (paragraph 3.33);
- (v) note the conclusions of the Scientific Committee concerning seabird by-catch and mitigating measures outside the Convention Area (paragraph 3.36);
- (vi) note the recommendations of the Scientific Committee concerning the development of closer links between CCSBT and CCAMLR, and other matters relating to the Commissions which regulate longline fishing in regions adjacent to the Convention Area (paragraph 3.37);
- (vii) note the recommendations of the Scientific Committee concerning changes to the timing of the *D. eleginoides* fishery in Subarea 48.3 to reduce incidental mortality

of seabirds (paragraph 3.41), the further discussion on this topic (paragraphs 3.42 to 3.45) and the advice to the Commission for the 1996/97 season (paragraph 3.46);

- (viii) note the recommendations concerning the retention of Conservation Measure 29/XIV, subject to a minor revision to clarify the meanings of 'nautical twilight' and 'dawn' (paragraph 3.49 to 3.52);
- (ix) note the positive effect of the ban on the use of netsonde cables in reducing incidental mortality of seabirds in the trawl fishery in Division 58.5.1 (paragraph 3.55); and
- (x) note the concerns of the Scientific Committee over evidence of recent increases in the problems caused by marine debris (originating from fishing vessels) to marine mammals and seabirds (paragraph 3.64).

Marine Mammal and Bird Populations

Status of Marine Mammal Populations

Whales

3.66 The Scientific Committee had asked the Chairman to write to the Scientific Committee of IWC (SC-IWC) to request reports on the status of Antarctic whales for review at the 1996 meeting (SC-CAMLR-XIV, paragraph 3.70). The Secretary of the IWC had responded (SC-CAMLR-XV/BG/9) that following discussions in the past, IWC had decided that because of the considerable scientific uncertainty over the number of whales it would be better not to give whale population figures except for those species/stocks which have been assessed in detail. In the case of whales of the Southern Ocean, this would include minke and blue whales only, although there is some less comprehensive and reliable information for other species, notably humpback whales.

3.67 The best estimates of abundance of minke whales, published in 1993, add up to more than 700 000 animals (SC-CAMLR-XV/BG/24, Table 1 as reported by SC-IWC-1993; Annex E, Appendix 6). Estimates of abundance of other species of whales are provided in SC-CAMLR-XV/BG/24, Table 2. Population estimates of blue whales remained low relative to previous estimates, while estimates of humpback whales had increased substantially.

3.68 The Scientific Committee expressed its appreciation to IWC for providing the information requested and noted this was another example of the close working relationship of CCAMLR and IWC members.

Antarctic Seals

3.69 Last year, the Chairman was asked to write to the Convener of the SCAR Group of Specialists on Seals (SCAR-GSS) requesting the group to consider the collection and analysis of data relevant to the aims of CCAMLR and the CEMP program in particular. No response having been received, the Scientific Committee deferred its consideration of this item until its next meeting.

Status of Marine Bird Populations

3.70 As has been done in the past, the Chairman was requested to write to the Chairman of the SCAR Bird Biology Subcommittee (SCAR-BBS) and ask for reports on the status of Antarctic birds (SC-CAMLR-XIV, paragraph 3.70). The SCAR Subcommittee provided a comprehensive review of the status and trends of Antarctic and sub-Antarctic seabirds (SC-CAMLR-XIV/BG/29). The review, provided for CCAMLR, was the third such undertaking by SCAR, with previous reviews completed in 1988 and 1992.

3.71 The current review provides a detailed summary of published and unpublished data on the distribution and abundance of penguins which updates the comprehensive review published by SCAR in 1993 (SC-CAMLR-XIV/BG/29, Appendix 2), information on the population status and trends of Antarctic and sub-Antarctic penguins as considered at the International Workshop on the Conservation and Management Plan for Penguins held in September 1996 (Appendix 3), and summaries of information on the distribution and abundance of several other species of Antarctic seabirds currently under detailed review by SCAR (Appendix 4).

3.72 SCAR-BBS also produced a summary of the status of all Antarctic seabird species (or species groups), drawing on the sources indicated above and the 1996 review of the status, trends and threats to populations of all albatross species (SC-CAMLR-XV/BG/21).

3.73 SCAR-BBS also provided a brief executive summary from which paragraphs 3.74 to 3.79 below are taken.

3.74 Populations of king penguins are increasing in numbers; however, except for emperor and gentoo penguins, all the other Antarctic and sub-Antarctic penguin species (including Adélie and chinstrap penguins) are currently showing an overall decrease in populations compared with those of a decade ago. The situation is potentially most serious for macaroni penguins and especially for rockhopper penguins, the latter being recommended for Globally Threatened status in the next IUCN Red Data Book.

3.75 For all sub-Antarctic albatross species breeding in the Convention Area, there is evidence of decreases from at least one site (and usually most, if not all, sites). Incidental mortality associated with longline fisheries is recognised as the main known or potential cause of these changes. Most species (including wandering, grey-headed and sooty albatrosses) are being recommended for Globally Threatened status; even the black-browed albatross is now regarded as deserving Near Threatened status.

3.76 Evidence of general decreases in giant petrel populations is less clear than in 1992, with new data indicating increases at some sites and decreases at others. More monitoring studies are needed.

3.77 Programs to eradicate introduced predators of seabirds (especially of burrowing species) at sub-Antarctic islands are proving successful. There is little, if any, evidence of change in populations due to human activities in the vicinity of breeding colonies.

3.78 There is still no evidence that any seabird population decreases reflect competition with commercial fisheries.

3.79 For some species and situations a better understanding is developing of interactions between the physical and biological environment in relation to prey availability and population processes in seabirds.

3.80 The Scientific Committee recognised the vast amount of work involved in preparing the review which it had requested and expressed its appreciation for the work of SCAR-BBS.