SCIENTIFIC COMMITTEE

4.1 The Chair of the Scientific Committee, Dr R. Holt (USA), reported on the meeting of the Scientific Committee. The Commission noted the general recommendations, advice, research and data requirements of the Scientific Committee. Substantive matters arising from the deliberations of the Scientific Committee were also discussed under other parts of the Commission's agenda: assessment and avoidance of incidental mortality (section 6); IUU fishing (section 8); new and exploratory fisheries (section 9); fisheries management and conservation under conditions of uncertainty (section 11); data access and security (section 12) and cooperation with other international organisations (section 14). The Commission thanked Dr Holt for his comprehensive report.

Intersessional Activities

- 4.2 The following meetings were held during the 2002/03 intersessional period:
 - (i) The ninth meeting of the Working Group on Ecosystem Monitoring and Management (WG-EMM) was held from 18 to 29 August 2003 in Cambridge, UK. It was convened by Dr Hewitt and was attended by 38 participants, representing 11 Members.
 - (ii) The CEMP Review Workshop was held during the first week of WG-EMM, from 18 to 22 August 2003. Attendees at the workshop included two invited experts, Prof. E. Hofmann and Dr T. Gerrodette (USA). The workshop was co-convened by Prof. J. Croxall (UK) and Dr C. Southwell (Australia).
 - (iii) The meeting of the Working Group on Fish Stock Assessment (WG-FSA) was held from 13 to 23 October 2003 in Hobart prior to the Scientific Committee meeting. It was convened by Dr I. Everson (UK) and was attended by 46 participants, representing 13 Members.

Two WG-FSA subgroups met during the intersessional period:

- the Subgroup on Assessment Methods (WG-FSA-SAM), convened by Dr A. Constable (Australia) 12 to 15 August 2003, London, UK;
- the Subgroup on Fisheries Acoustics (WG-FSA-SFA), co-convened by Dr M. Collins (UK) and Dr P. Gasiukov (Russia) – 18 to 22 August 2003, Cambridge, UK.
- (iv) the ad hoc Working Group on Incidental Mortality Arising from Fishing (WG-IMAF) conducted its meeting as part of WG-FSA-03. It was convened by Prof. Croxall.

4.3 The Commission joined the Scientific Committee in thanking the conveners of these working groups and subgroups for their contributions to the work of CCAMLR.

CCAMLR Scheme of International Scientific Observation

4.4 The Commission noted that scientific observers had conducted 37 observation trips on longline vessels, 10 trips on board finfish trawlers and 6 trips on board krill vessels during the 2002/03 season to October 2003. All required logbooks and reports had been submitted electronically. However, most observers in Subarea 48.3 had not used the revised reporting format agreed in 2002. Although the failure to use the new format had not significantly affected the quality or resolution of data required from the fishery, the Commission endorsed the Scientific Committee's advice and urged Members to use the agreed new format when submitting observer data in 2003/04 (SC-CAMLR-XXII, paragraphs 2.2 and 2.3).

4.5 The Commission also noted the other issues addressed by the Scientific Committee (SC-CAMLR-XXII, paragraphs 2.4 to 2.10), especially:

- Several observers had commented on issues of safety concerning vessels fishing in high latitudes and the Scientific Committee had referred the issue to the Commission (see paragraphs 6.17 to 6.19).
- The workload of scientific observers was at full capacity, and the Scientific Committee had endorsed the recommendation of WG-FSA that WG-FSA-SAM identify the types of observer data which were essential for stock assessment purposes.
- The Scientific Committee had endorsed a major review of the content and structure of the *Scientific Observers Manual*, and had recommended that this activity be undertaken by an intersessional group that included technical coordinators and members of WG-FSA, and be coordinated by the Secretariat.

Ecosystem Monitoring and Management

4.6 The Commission noted the further progress made by the Scientific Committee and WG-EMM in developing a feedback management scheme for the krill fishery. As part of this work, WG-EMM-03 had held a CEMP Review Workshop under the co-convenership of Prof. Croxall and Dr Southwell.

- 4.7 The Commission recalled that CEMP had been established in 1987 to:
 - (i) detect and record significant changes in critical components of the ecosystem;
 - (ii) distinguish between changes due to the harvesting of marine resources and changes due to environmental variability.

4.8 The CEMP Review Workshop had examined the following questions (SC-CAMLR-XX, paragraphs 4.2 to 4.7):

- (i) Are the nature and use of the existing CEMP data still appropriate for addressing the original objectives?
- (ii) Do these objectives remain appropriate and/or sufficient?

- (iii) Are additional data available which should be incorporated in CEMP or be used in conjunction with CEMP data?
- (iv) Can useful management advice be derived from CEMP or be used in conjunction with CEMP data?

4.9 With regard to the first term of reference (paragraph 4.8(i)), the Commission noted that CEMP data were appropriate for detecting and recording significant change in some critical components of the ecosystem, but further critical evaluation of the nature, magnitude and statistical significance of changes indicated by the data were necessary. Work also remains to determine how representative the CEMP sites are of their local areas and regions (SC-CAMLR-XXII, paragraph 3.11).

4.10 With regard to the second term of reference (paragraph 4.8(ii)), the Commission noted that the original objectives of CEMP remained appropriate, but that a third objective 'To develop management advice from CEMP and related data' should be added (SC-CAMLR-XXII, paragraph 3.14(i)).

4.11 The Commission agreed that this third objective should be added to CEMP.

4.12 With regard to the original third term of reference (paragraph 4.8(iii)), the Commission noted that many time series of non-CEMP data contain information of considerable value in addressing the objectives of CEMP. The Secretariat was tasked with maintaining a register of the wide range of non-CEMP time-series data that were of use to the workshop and of potential utility to future workshops in support of the work of WG-EMM. Such data include datasets derived from South African and French seabird and pinniped monitoring programs in the southern Indian Ocean (SC-CAMLR-XXII, paragraph 3.14(ii)).

4.13 The Commission also noted that additional useful indices of krill availability to land-based krill predators could be derived from fishery-dependent data and, with indices derived from mackerel icefish data, may be of value in monitoring krill in certain regions and should be subjected to the same analyses undertaken for CEMP data (SC-CAMLR-XXII, paragraph 3.14(iii)).

4.14 With regard to the fourth term of reference (paragraph 4.8(iv)), the Commission noted that (SC-CAMLR-XXII, paragraph 3.14(iv)):

- functional responses linking predators to their prey field may be of utility in a management context;
- behavioural models based on interactions between the aspects of the environment, krill, krill predators and a krill fishery may also be of utility in a management context;
- simulation studies conducted during the workshop indicated that accounting for the nature of the variability of estimates of krill availability and predator performance could result in improved ability to detect anomalies.

4.15 The Commission also noted the other findings of the workshop (SC-CAMLR-XXII, paragraphs 3.9, 3.10 and 3.15).

4.16 The Commission agreed that the workshop should be considered as the first phase of the review of CEMP and noted that the Scientific Committee had laid out a plan of future work for WG-EMM in this respect (SC-CAMLR-XXII, paragraph 3.16). The most important tasks identified included:

- (i) completion of the review of sources and magnitudes of variability in predator-response parameters;
- (ii) investigation of the utility of indices derived from haul-by-haul catch per unit effort (CPUE) data as a proxy for direct measures of krill availability;
- (iii) investigation of alternative methods for determining anomalies and predicting krill abundance using predator response curves.

4.17 The Scientific Committee noted that it may never be possible to unambiguously attribute causes of ecosystem change independently to either the actions of the krill fishery or to environmental change. Therefore, the Scientific Committee had sought advice from the Commission concerning a policy outlining how management should proceed when a significant ecosystem change(s) was detected but no single causal factor could be identified (SC-CAMLR-XXII, paragraph 3.12).

4.18 The Commission advised that the Scientific Committee should continue working on this issue in the context of developing the management procedure for the krill fishery. In the meantime, the Commission agreed that it would need to apply appropriate levels of precaution when taking decisions regarding the impacts of the krill fishery on the ecosystem.

4.19 The Commission joined the Scientific Committee in thanking the Co-conveners of the CEMP Review Workshop, Prof. Croxall and Dr Southwell, and the Secretariat for their work in preparing for the workshop, and the USA for contributing to the travel support of invited experts.

Status and Trends in the Krill-centric Ecosystem

4.20 The Commission noted that the Scientific Committee and WG-EMM had reviewed the status and trends apparent in the CEMP indices and noted that there was little evidence of large-scale deviation from the long-term mean for most indices (SC-CAMLR-XXII, paragraph 3.20).

4.21 The Commission also noted that:

- alternative approaches to presenting CEMP indices will be examined during the intersessional period (SC-CAMLR-XXII, paragraph 3.22);
- further analyses were required to understand the relative contribution of flux and local retention of krill within different regions, and that these findings may be important to allocating precautionary catch limits to SSMUs and may have implications for the manner in which long-term precautionary yield of krill is calculated, which currently assumes a single krill population (SC-CAMLR-XXII, paragraph 3.24);

- it may be appropriate for the Scientific Committee to produce a coherent overview of environmentally induced variability in the Southern Ocean and to consider potential scenarios that might influence ecological relationships with implications for fisheries management (SC-CAMLR-XXII, paragraph 3.27);
- the assessment of ecological relationships and trophic interactions involving exploited fish stocks would require closer collaboration between WG-EMM and WG-FSA, and the Scientific Committee would consider how this may be incorporated into the work of these groups (SC-CAMLR-XXII, paragraph 3.29).

4.22 The Commission noted that four options for subdividing the precautionary catch limit for krill in Area 48 among SSMUs had been discussed. The Scientific Committee had called for additional proposals to be developed during the intersessional period with the expectation of forwarding a recommendation to CCAMLR-XXIII (SC-CAMLR-XXII, paragraphs 3.32 to 3.43).

Non-krill Centred Ecosystem

4.23 The Commission noted that the Scientific Committee was also considering ecosystem pathways that were centred on fish (SC-CAMLR-XXII, paragraphs 3.55 to 3.61).

4.24 In this context, the Scientific Committee had encouraged future work to develop methods to incorporate data on interactions between mackerel icefish and upper-trophic bvel predators into assessment procedures and into ecosystem models involving mackerel icefish.

4.25 In addition, time series of data on the diet of Antarctic shags have the potential to provide useful information on ecosystem dynamics to the benefit of the Scientific Committee's work.

Advisory Subgroup on Protected Areas

4.26 The Commission endorsed the following terms of reference for the Scientific Committee's Advisory Subgroup on Protected Areas:

- to review the details of proposals relating to designation and protection of CEMP monitoring sites and review of CEMP management plans as required in accordance with Conservation Measure 91-01;
- (ii) to revise and keep under review, as appropriate, guidelines for the production of maps of protected areas relevant to CCAMLR;
- (iii) to develop and keep under review, as appropriate, a methodology for assessment of proposals for marine protected areas forwarded in accordance with Article 6(2) of Annex V of the Protocol on Environmental Protection to the Antarctic Treaty;

- (iv) to provide advice on marine protected areas that seek designation as an Antarctic Specially Protected Area (ASPA) or an Antarctic Specially Managed Area (ASMA) under the Antarctic Treaty;
- (v) to provide advice on the implementation of marine protected areas that may be proposed in accordance with the provisions of Article IX.2(g) of the Convention, including 'the designation of the opening and closing of areas, regions or subregions for purposes of scientific study or conservation, including special areas for protection and scientific study'.

4.27 The Commission noted that New Zealand intends to submit a proposal for an ASPA around the Balleny Islands for consideration at WG-EMM in 2004.

4.28 Brazil welcomed the announcement of new proposals for protected areas with a marine component or marine protected areas because they are an important tool for the preservation of species, habitats or ecosystems and Antarctic biodiversity.

Future Work of WG-EMM

4.29 The Commission endorsed the long-range work plan of the Scientific Committee's WG-EMM (SC-CAMLR-XXII, Table 1). This plan was organised around five broad issues:

- (i) subdivision of the precautionary catch limit for krill in Area 48;
- (ii) revised krill management procedure;
- (iii) assessment of predator demand;
- (iv) subdivision of large FAO statistical areas;
- (v) strategic planning.

4.30 The Commission noted that this plan involved a tremendous amount of work which would require intersessional activities. Therefore, the Scientific Committee had agreed that work should be well advanced on the development of a management procedure for krill before other substantial work programs were initiated. The Commission also noted that work on specifying the future of CEMP should begin in 2005 with discussions on management procedures when monitoring the krill fishery will be an important consideration (SC-CAMLR-XXII, paragraph 3.52).

Harvested Species

4.31 CCAMLR Member countries actively participated in eight fisheries under conservation measures in force in the 2002/03 season (1 December 2002 to 30 November 2003). These eight fisheries were:

- trawl fishery for *Champsocephalus gunnari* in Subarea 48.3;
- trawl fishery for *C. gunnari* in Division 58.5.2;
- longline fishery for *Dissostichus eleginoides* in Subarea 48.3;
- trawl and longline fishery for *D. eleginoides* in Division 58.5.2;
- exploratory longline fishery for *Dissostichus* spp. in Division 58.4.2;

- exploratory longline fishery for *Dissostichus* spp. in Subarea 88.1;
- exploratory longline fishery for *Dissostichus* spp. in Subarea 88.2;
- trawl fishery for *Euphausia superba* in Area 48.

4.32 In addition, four other fisheries were conducted in EEZs within the Convention Area:

- longline fishery for *D. eleginoides* in Division 58.5.1 (French EEZ);
- longline fishery for *D. eleginoides* in Subarea 58.6 (French EEZ);
- longline fishery for *D. eleginoides* in Subarea 58.6 (South African EEZ);
- longline fishery for *D. eleginoides* in Subarea 58.7 (South African EEZ).

4.33 Fourteen Members had fished in the 2002/03 season: Australia, Chile, France, Japan, New Zealand, Poland, Republic of Korea, Russian Federation, South Africa, Spain, Ukraine, UK, USA and Uruguay.

Krill Fishing

4.34 The krill fishery in the 2002/03 season has operated in Subarea 48.1, 48.2 and 48.3 and the catch reported to 3 October 2003 was 110 334 tonnes (SC-CAMLR-XXII, Table 2). The total catch for 2002/03 is expected to be similar to that reported in 2001/02 (125 987 tonnes) once catch figures for the remainder of the 2002/03 season have been received (SC-CAMLR-XXII, Table 3).

4.35 The Commission noted that the projected krill catch for the 2003/04 season was more than 30% greater than the expected total catch for the 2002/03 season (SC-CAMLR-XXII, Table 4). This projected increase was considered significant because in most previous years total future catch levels indicated to the Scientific Committee had been at or below existing catch levels.

4.36 The Commission noted that the Scientific Committee and WG-EMM had been unable to make any assessment of the developments in the krill fishery because information on future fishery plans by Members was usually incomplete and/or anecdotal, with the exception of Poland which had provided comprehensive information on its upcoming krill fishing activities in its Members' Activities Report. Therefore the Scientific Committee had developed a pro forma which Members could use on a voluntary basis to submit information on their fishing plans for the forthcoming season (SC-CAMLR-XXII, Annex 6).

4.37 The Commission endorsed the notification procedure developed by the Scientific Committee (SC-CAMLR-XXII, Annex 6), and urged all Members intending to fish for krill in the upcoming season to complete the notification in advance of the annual meeting of WG-EMM. Notifications should be submitted to the Secretariat.

4.38 The Commission recognised that some Members may consider that the information requests in the notification regarding post-harvest processing of krill are in breach of commercial confidentiality. However, the Commission also recognised that information on proposed krill products was important to understanding developments and trends in the fishery.

4.39 The Commission agreed that the submission of information in the notification would be provided by Members on a voluntary basis.

Fish Resources

Toothfish

4.40 A total of 15 931 tonnes of *Dissostichus* spp. was taken in the Convention Area during the 2002/03 season (to 3 October 2003), compared with 15 302 tonnes in the previous season (SC-CAMLR-XXII, Tables 2 and 3).

4.41 Data reported in the CDS indicated that 18 919 tonnes of *Dissostichus* spp. was taken outside the Convention Area in 2002/03 (to 3 October 2003) and this compared with 35 484 tonnes in the previous season (SC-CAMLR-XXII, Annex 5, Table 3.1). The Commission noted that most of the catch outside the Convention Area was reported from Areas 41, 47, 51, 57 and 87 (SC-CAMLR-XXII, paragraph 4.18).

4.42 The Committee noted progress made on assessment methods by WG-FSA-SAM and WG-FSA-SFA during their intersessional meetings in August 2003. Both subgroups had made substantial contributions to improving the methods and procedures for the assessments at this year's meeting of WG-FSA. The Commission joined the Scientific Committee in thanking the subgroup participants and convener and host of WG-FSA-SAM, Drs Constable and G. Kirkwood (UK), and the conveners of WG-FSA-SFA, Drs Collins and Gasiukov (SC-CAMLR-XXII, paragraphs 4.32 and 4.33).

4.43 The Commission noted that the assessments of *D. eleginoides* made in 2003 followed the procedures established by the Scientific Committee and WG-FSA.

4.44 However, the Commission noted with concern that a review by WG-FSA of estimates of recruitment used in the 2002 assessment of *D. eleginoides* in Subarea 48.3 had identified a number of problems (SC-CAMLR-XXII, Annex 5, paragraphs 5.104 to 5.111). In particular, there had been an error in the data extractions for the 2002 UK survey that led to the recruitments in 2001, 2002 and 2003 being substantially overestimated.

4.45 Inconsistencies had also been identified in the analyses of the 1990 UK survey data. As a result the corresponding recruitment estimates calculated in 2002 were too high and the estimates of recruitment from the 1990 survey may have affected estimates of yield prior to 2002 (SC-CAMLR-XXII, paragraph 4.47).

4.46 The Commission noted that the precautionary catch limit of *D. eleginoides* in Subarea 48.3 in the 2003/04 season, resulting from use of the original 2002 recruitment series, was 7 813 tonnes and similar to that estimated last year. However, when the revised recruitment series for the 2002 survey was used, the precautionary catch limit was reduced to 5 524 tonnes. When the revised series for both the 1990 and 2002 surveys were used, the precautionary catch limit was reduced further to 1 979 tonnes (SC-CAMLR-XXII, paragraph 4.58).

4.47 However, it was noted that the value of 1 979 tonnes may be incorrect due to errors in the relevant analyses which had generated values that might now be too low (SC-CAMLR-XXII, Annex 5, paragraph 5.121; SC-CAMLR-XXII, paragraph 4.59).

4.48 The Commission recalled its discussion last year when it increased the catch limit for the 2002/03 season, and the subsequent concern expressed by some Members (CCAMLR-XXI, paragraphs 11.43 and 11.44).

4.49 In view of the concerns expressed last year, and the errors in the assessment identified this year, the Commission recognised the uncertainty underlying the advice from the Scientific Committee regarding the catch limit for *D. eleginoides* in Subarea 48.3 in the 2003/04 season (SC-CAMLR-XXII, paragraphs 4.65 and 4.70).

4.50 However, the Commission noted that, because the catch limits for *D. eleginoides* are precautionary long-term catch limits for a long-lived species, a failure to reliably estimate a precautionary yield in a single year would be less serious than would be the case for a fishery subject to annual assessments of optimised yield. Following the determination by WG-FSA of a revised recruitment series for Subarea 48.3 next year, it will become apparent whether or not previous catches have been above those that would have been calculated historically as precautionary yields using that recruitment series. The Commission noted that if previous catches have been above precautionary yield levels, then this will be taken into account when calculating subsequent precautionary yields (SC-CAMLR-XXII, Annex 5, paragraph 5.123).

4.51 The Commission was pleased to note that in order to continue improving the quality control procedures for the assessment process, the Scientific Committee had endorsed the recommendation of WG-FSA that validation procedures be developed for all data extractions and analytical procedures and that they be routinely applied during the assessment process (SC-CAMLR-XXII, paragraphs 4.48 and 4.49).

4.52 The Commission also noted that WG-FSA undertook a large amount of work at its meetings and that the assessments were becoming increasingly complex. It was also acknowledged that the manner in which the assessments are now done facilitates the direct involvement of a wider range of participants in the assessment process. This corporate approach to the work had improved the rigour and transparency of the assessments conducted by WG-FSA (SC-CAMLR-XXII, paragraph 4.56).

4.53 The Commission noted the advice of the Scientific Committee regarding stocks of *D. eleginoides* in Subareas 48.4, 58.6 and 58.7 and Division 58.5.2 (SC-CAMLR-XXII, paragraphs 4.78, 4.89, 4.90, 4.93, 4.94, 4.96 and 4.97).

4.54 Regarding the stock of *D. eleginoides* in Division 58.5.1, the Commission noted the dramatic increase in total removals from 2000 onwards and the corresponding decline in standardised CPUE. It also noted that the increase in total removals and decline in CPUE was due to increased IUU catches, not legal catches by French vessels. The Commission endorsed the Scientific Committee's advice that it was imperative that steps be taken to substantially reduce total removals from 2003 levels (SC-CAMLR-XXII, paragraphs 4.82 and 4.83). Accordingly, the Commission also urged France to take the necessary actions in relation to the fishery in its EEZ.

Icefish

4.55 A total of 4498 tonnes of *C. gunnari* was taken in the Convention Area during the 2002/03 season (to 3 October 2003), compared with 3532 tonnes in the previous season (SC-CAMLR-XXII, Tables 2 and 3).

4.56 The Commission noted that, following the work developed by WG-FSA-SFA, WG-FSA had agreed to incorporate the results from an acoustic survey in its current assessment of *C. gunnari* in Subarea 48.3. The acoustic survey was conducted in 2002 and provided an estimate of a component of the pelagic biomass of *C. gunnari* in the depth range 8–58 m above the bottom (SC-CAMLR-XXII, Annex 5, paragraphs 5.148 to 5.152).

4.57 The Commission also noted that the Working Group had done two assessments of the precautionary catch limit for *C. gunnari* in 2003/04 (SC-CAMLR-XXII, Annex 5, paragraphs 5.169 to 5.172). The first assessment included the age-1+ cohort from 2001/02 and resulted in a projected yield of 3570 tonnes for the 2003/04 season. The assessment excluding the age-1+ cohort from 2001/02 resulted in a projected yield of 2 205 tonnes for the 2003/04 season (SC-CAMLR-XXII, paragraph 4.101). WG-FSA had been unable to agree on a single catch limit.

4.58 The Commission noted the advice of the Scientific Committee that an appropriate precautionary catch limit for *C. gunnari* in Subarea 48.3 for the 2003/04 season lay in the range bounded by the two assessments conducted by WG-FSA (2 205–3 570 tonnes). However, in view of the uncertainties in the natural mortality rates assumed in the assessment that included age-1 fish in the projections (SC-CAMLR-XXII, paragraphs 4.101 to 4.109), and other uncertainties (SC-CAMLR-XXII, Annex 5, paragraphs 5.170 to 5.172), the Scientific Committee was unable to recommend a specific precautionary catch limit within this range (SC-CAMLR-XXII, paragraph 4.110).

4.59 The Commission also noted that the Scientific Committee had no information from which to consider or revise advice in respect of the current seasonal limitation of the fishery for *C. gunnari* in Subarea 48.3 (SC-CAMLR-XXII, paragraph 4.111).

4.60 The Commission agreed that the fishery for *C. gunnari* within the French EEZ of Division 58.5.1 should remain closed in the 2003/04 season and should remain closed until information on stock status is obtained from a survey (SC-CAMLR-XXII, paragraph 4.112).

4.61 The Commission endorsed the Scientific Committee's advice regarding the fishery for *C. gunnari* in Division 58.5.2 (SC-CAMLR-XXII, paragraphs 4.117 and 4.118). It also noted that the Scientific Committee had considered ways of providing for stable catches from one year to another given the large fluctuations in the abundance of this species. The Scientific Committee had considered ways to avoid harvesting age-2 fish which enter the fishery during each season. One suggestion to solve the latter problem was to set a minimum length of 290 mm from May 2004 (SC-CAMLR-XXII, paragraph 4.119).

Other Finfish Species

4.62 The Commission endorsed the Scientific Committee's advice for other finfish fisheries including the advice that the fishery for *Electrona carlsbergi* in Subarea 48.3 should be closed until WG-FSA has sufficient information to revise the assessment of long-term yield (SC-CAMLR-XXII, paragraphs 4.121, 4.123 and 4.124).

By-catch Species

4.63 The Commission noted that the Scientific Committee had made progress towards assessing the long-term status of by-catch species associated with longline and trawl fisheries (SC-CAMLR-XXII, paragraphs 4.128 to 4.149). It was also noted that the next meeting of WG-FSA would consider by-catch issues of potential mutual interest to WG-FSA and ad hoc WG-IMAF.

- 4.64 Specifically, the Commission noted that:
 - insufficient biological information was available for rajids (skates and rays) and no assessments could be currently undertaken for these taxa (SC-CAMLR-XXII, paragraph 4.131);
 - for the other high-priority species group, macrourids (rattails or grenadiers), there were sufficient biological data available to estimate the value of γ for the three species of *Macrourus* encountered in the fisheries in the Convention Area and these values indicated that these species have relatively low productivity and may be vulnerable to overexploitation (SC-CAMLR-XXII, paragraph 4.132);
 - for *M. carinatus* in Division 58.5.2 an estimate of biomass (B₀) was available and the Scientific Committee had provided the best available estimate of precautionary by-catch limit (SC-CAMLR-XXII, paragraph 4.134);
 - however, no estimates of B₀ were available for *Macrourus* spp. in Subareas 48.3 or 88.1 and as such, no estimate of precautionary yield could be calculated (SC-CAMLR-XXII, paragraph 4.133);
 - the by-catch limits, with their attendant uncertainties, should not be used as an indication of long-term sustainable yield, and sustained by-catch at these levels over a number of years would require a revised assessment (SC-CAMLR-XXII, paragraph 4.135);
 - the development of avoidance and mitigation measures for by-catch species should be given high priority (SC-CAMLR-XXII, paragraph 4.136);
 - WG-FSA had attempted to estimate the amount of by-catch which was cut from, or dropped off, longlines before being brought on board – WG-FSA had also made a first attempt to estimate the survivorship of these fish in the catch-release process (SC-CAMLR-XXII, Annex 5, paragraphs 5.273 to 5.279) and that the Scientific Committee had encouraged further studies on skate survivorship (SC-CAMLR-XXII, paragraph 4.143);

• discrepancies in reporting by-catch existed between STATLANT data, haul-by-haul data, and catch and effort reports which Members submit regularly to the Secretariat (SC-CAMLR-XXII, paragraphs 4.146 and 4.147).

4.65 The Commission noted the management advice provided by the Scientific Committee, and urged all Members to accurately report catches of by-catch species when submitting STATLANT data, haul-by-haul data, and catch and effort reports.

Crab Resources

4.66 The Commission noted that the fishery for crab in Subarea 48.3 was not carried out in the 2002/03 season and that no proposal to harvest crab had yet been received for the 2003/04 season. The Commission endorsed the management advice provided by the Scientific Committee (SC-CAMLR-XXII, paragraph 4.221).

Squid Resources

4.67 The Commission noted that the fishery for *Martialia hyadesi* in Subarea 48.3 was not carried out in the 2002/03 season and that no notification to harvest this species had been received for the 2003/04 season. The Commission endorsed the management advice provided by the Scientific Committee (SC-CAMLR-XXII, paragraph 4.222).

Future Work

4.68 The Commission endorsed the work plan of the Scientific Committee's WG-FSA (SC-CAMLR-XXII, Annex 5, paragraphs 9.1 to 9.25). In doing so, the Commission noted that future assessment work needed to include the recommendations of WG-FSA-SAM.

4.69 The Commission noted that this work plan included a full review and revision of the recruitment series for *D. eleginoides* in Subarea 48.3 during the intersessional period. The Scientific Committee had recognised the importance of obtaining a consistent and reliable recruitment series for assessing the stock of *D. eleginoides* in Subarea 48.3 and had emphasised the importance of having information available for review at its meeting in 2004 (SC-CAMLR-XXII, paragraph 4.73).

Scientific Research Exemption

4.70 The Commission noted that scientific research surveys notified to the Secretariat under Conservation Measure 24-01 are regularly updated on the CCAMLR website. Notifications of surveys in 2003/04 received by the Secretariat were also listed in CCAMLR-XXII/BG/8 Rev. 1.

4.71 The Commission recalled that it had requested the Scientific Committee to review the list of taxa and their expected levels of catch in Annex B of Conservation Measure 24-01, taking into account the expected levels below which notification would not be required (CCAMLR-XXI, paragraph 11.26).

4.72 In reviewing the list of taxa and their expected levels of catch, the Scientific Committee noted that catches of *C. gunnari* exceeding 10 tonnes per half-hour tow have occurred occasionally during scientific trawl surveys, and that pelagic trawl equipment used in conjunction with future acoustic surveys similarly may result in catches exceeding 10 tonnes. The Scientific Committee recommended that a 50 tonne limit for *C. gunnari* would be appropriate for scientific research (SC-CAMLR-XXII, paragraph 8.6).

4.73 The Commission endorsed the Scientific Committee's advice and noted that the Scientific Committee would keep Annex B of Conservation Measure 24-01 under review.

Secretariat Supported Activities

4.74 The Commission noted the data management activities which the Secretariat had undertaken in 2002/03 (SC-CAMLR-XXII, paragraphs 12.1 to 12.8).

4.75 The Commission also noted that the Scientific Committee had considered the draft rules for submission of CCAMLR meeting papers (CCAMLR-XXII/5 Rev. 1) and agreed that these draft rules did not adequately describe the requirements for the submission of papers to the Scientific Committee. As a result, the Scientific Committee proposed that, for the purpose of its discussion this year, the Commission only consider the draft rules in relation to the submission of papers to the Commission (SC-CAMLR-XXII, paragraphs 12.31 and 12.32; paragraph 3.6 of this report).

Publications

4.76 In addition to annual reports of CCAMLR, the Commission noted that the following documents were also published in 2003:

- (i) *CCAMLR Scientific Abstracts*, covering abstracts of papers presented in 2002;
- (ii) CCAMLR Science, Volume 10 (distributed at the meeting);
- (iii) Statistical Bulletin, Volume 15;
- (iv) Revisions to Inspectors Manual and Scientific Observers Manual.

4.77 The Commission recalled that in 2002 the Scientific Committee had agreed to take steps to overcome problems with papers submitted to *CCAMLR Science* for which English was not the author's primary language, and which may need additional assistance with language editing (SC-CAMLR-XXI, paragraphs 12.17 and 12.19 to 12.21). Subsequently, the Commission had approved funding for language support for *CCAMLR Science*.

4.78 The Commission endorsed the guidelines for providing language support for manuscripts where initial evaluation by the Editor of *CCAMLR Science* had revealed substantial problems with the English text (SC-CAMLR-XXII, Annex 7).

Scientific Committee Activities

4.79 The Commission noted that the Scientific Committee had planned the following activities in 2003/04:

- meeting of WG-EMM in Siena, Italy, from 12 to 23 July 2004, including the Workshop on Plausible Ecosystem Models for Testing Approaches to Krill Management;
- meeting of WG-FSA, including ad hoc WG-IMAF in Hobart, Australia, from 11 to 22 October 2004;
- meeting of WG-FSA-SAM in Siena, Italy, from 5 to 9 July 2004, immediately prior to WG-EMM-04.

4.80 The Commission noted that, as agreed at last year's meeting of the Scientific Committee, Dr Everson would stand down as convener of WG-FSA at the end of this year's meeting, and that Dr S. Hanchet (New Zealand) would take up the convenership of WG-FSA.

4.81 The Commission joined the Scientific Committee in expressing its deep appreciation for Dr Everson's outstanding contribution to the work of CCAMLR. Dr Everson had participated in the meetings of the Commission, Scientific Committee and working groups since CCAMLR-III in 1984. He had chaired the Scientific Committee from 1987 to 1990 and had convened WG-EMM from its first meeting in 1995 until 1999 and WG-FSA in 1993 and 1994 and again in 2002 and this year. The Commission and Scientific Committee wished Dr Everson a very happy and rewarding retirement.

4.82 The Commission joined the Scientific Committee in welcoming Dr Hanchet as the new convener of WG-FSA.

Invitation of Observers to the Next Meeting

4.83 The Commission noted that the Scientific Committee had agreed that all observers invited to the 2003 meeting would be invited to participate in SC-CAMLR-XXIII.

Other Business

4.84 The Commission noted that the Secretariat had submitted two abstracts to the Fourth World Fisheries Congress (CCAMLR-XXII/BG/22). The abstracts reviewed CCAMLR's work in addressing the objectives of the Convention and CCAMLR's approach to managing by-catch. The Commission also noted that the Scientific Committee had expressed concern, particularly in relation to the latter abstract, over the presentation and potential publication of scientific information derived from the main work of working groups of the Scientific Committee without prior review by those responsible for the work carried out within those groups. The Scientific Committee was also concerned at potential overlap between the contents of the by-catch presentation and that of the conveners of WG-EMM and WG-FSA, already endorsed by the Scientific Committee, for presentation at the same meeting. This

matter was referred to the Secretariat for immediate consideration in consultation with the Chair of the Scientific Committee and conveners of working groups and to the Commission in respect of any matters of principle involved (SC-CAMLR-XXII, paragraph 15.8) (see also paragraphs 14.61 and 14.62).