ECOSYSTEM MONITORING AND MANAGEMENT

5.1 Dr J. Bengtson (USA), Convener, presented the Report of the Fourth Meeting of the Working Group for the CCAMLR Ecosystem Monitoring Program (WG-CEMP) held at Stockholm, Sweden, 6 to 13 September 1990 (Annex 6), the highlights of which were summarised in SC-CAMLR-IX/11.

5.2 The Scientific Committee thanked the Working Group for its work during the intersessional period and at the meeting. It reviewed the report, focusing particularly on the current status of the main undertakings, and the implications and requirements for present action and future work.

Relevance of CEMP to the Work of the Commission

5.3 WG-CEMP had responded to the requests from the Scientific Committee and Commission (CCAMLR-VIII, paragraphs 68 and 69) to provide advice on operational definitions of depletion, on the ability of CEMP to detect changes in ecological relations (Annex 6, paragraphs 35 and 36) and to consider approaches to the use of CEMP data as part of CCAMLR fisheries management strategies.

5.4 In respect of the latter topic, the Scientific Committee noted and approved:

(i) that WG-CEMP had identified as a specific priority the development of ways of incorporating the data on monitored predator parameters in the formal management deliberations of CCAMLR by the Scientific Committee and the Commission;

(ii) the agreement to determine annually the magnitude, direction and significance of year-to-year and overall trends in each of the predator parameters being monitored at each site;

(iii) the agreement:

(a) to evaluate annually these data on species, site and region specific bases;

(b) to consider the conclusions in the light of a comprehensive range of relevant biological information;

(c) to formulate, where appropriate, advice to the Scientific Committee; and

(iv) the conclusion that analysis and evaluation of submitted CEMP data and developments of recommendations based thereon did not require, and should not await, the determination of the precise quantitative nature of predator/prey/environmental relationships.

5.5 The Scientific Committee approved the request that both Members and the Secretariat should undertake the work referred to in paragraph 5.4 (ii), encouraged WG-CEMP to develop and agree comprehensive instructions for doing this, and endorsed the request to Members to submit explicit proposals to the next meeting of WG-CEMP.

5.6 In a broader general consideration of these initiatives the Scientific Committee noted that the approach developed would benefit from considering as wide a variety of parameters as possible. WG-CEMP was requested to continue to evaluate additional parameters of potential value and, where appropriate, to develop standard methods (including data collection and reporting formats).

5.7 In this regard, the Scientific Committee noted that WG-CEMP had indicated that to expedite the development of standard methods involving activity (e.g., diving, feeding) budgets of seals and seabirds at sea, a workshop on the use of devices currently employed in such studies was an important requirement. The Scientific Committee endorsed this suggestion and encouraged the Working Group to develop detailed proposals.

Predator Monitoring

5.8 The Scientific Committee noted the potential addition of Esperanza Station (Argentina) as a CEMP Network Site and the suggestion, reinforced by a formal recommendation from SCAR to appropriate national committees, that Admiralty Bay, King George Island (within the Antarctic Peninsula Integrated Study Region) should be reinstated as a CEMP site.

5.9 The change in the eastern and southeastern boundaries of the Antarctic Peninsula Integrated Study Region to make them coincide with the eastern and southeastern boundaries

of Subarea 48.1 was approved. The other boundaries of the Antarctic Peninsula Integrated Study Region remain unchanged.

5.10 The Scientific Committee also approved the addition of the gentoo penguin (*Pygoscelis papua*) as a designated CEMP species and urged WG-CEMP to complete appropriate modifications to standard methods and data reporting formats as soon as possible.

5.11 It was noted that WG-CEMP had completed a major revision of the CEMP Standard Methods, including approving the revised data reporting forms and instructions, which were now available for most approved methods.

5.12 The Secretariat would shortly be circulating the version incorporating the revisions agreed at the recent WG-CEMP meeting and the revisions carried out during this Meeting of the Scientific Committee.

5.13 With the completion of the procedure for submission of CEMP data to the CCAMLR Data Centre and the agreement on access procedures to such data (CCAMLR-VIII, paragraph 64), the decision of the Commission (CCAMLR-VIII, paragraph 57) requiring Members monitoring approved parameters of selected species at nominated sites using approved standard methods to submit these data to the Secretariat annually by 30 September, comes into force. Retrospective data conforming to the same criteria are also required as soon as possible.

5.14 A number of Members had already submitted data for 1989/90 to the CCAMLR Data Centre (summarised in SC-CAMLR-IX/BG/5) and other Members were urged to do so as soon as possible.

5.15 WG-CEMP had advised that it would be helpful to have data from the most recent austral summer available for review at the meetings of WG-CEMP, which have usually been held in July/August. A revision of the deadline for annual submission of CEMP data to 30 June had been suggested; this was approved by the Scientific Committee.

5.16 WG-CEMP had addressed the issue of ensuring that field research techniques (e.g., those advocated in the Standard Methods) should be carried out in standard approved fashion and in such a way so as to minimise adverse effects on wildlife.

5.17 The Scientific Committee endorsed the suggestion of WG-CEMP that Members should seek to document the general procedural effects (e.g., effect of investigators presence

and activities or effects induced by attaching devices). It also supported the preparation of appropriate documentation (including video tape recording) on field techniques (e.g., banding, stomach pumping, sex determination, etc.), with a view to producing instructional guides and noted the suggestion that a workshop might be helpful in achieving this.

Prey Monitoring

5.18 The Scientific Committee noted the valuable continuing dialogue between WG-CEMP and WG-Krill in respect of the development of guidelines for prey surveys in support of the objectives of WG-CEMP. In particular, Members' attention was drawn to the desirability of their active participation in the work of the subgroup established by WG-Krill to undertake the detailed development of such surveys, and the interim operational guidelines suggested by WG-Krill for such surveys (Annex 4, paragraph 100 and paragraph 2.47 of this Report).

5.19 Essential complements to these surveys were the continuing timely availability of the data on fine-scale distribution of krill within the Integrated Study Regions and data on relative abundance of krill on a subarea scale. The latter is likely to depend on fishery-derived indices and further work on developing the Composite Index of Krill Abundance was urged.

5.20 With respect to the need for data on other prey species of importance to predators, the Scientific Committee:

(i) reiterated the requirement (SC-CAMLR-VIII, Annex 6, paragraph 144) for the submission of fine-scale data for catches of *P. antarcticum* in Subarea 58.4 (and especially in the Prydz Bay Integrated Study Region), particularly including the data from the large catches in 1985 and 1986; and

(ii) drew attention to the recently developed fishery for *E. carlsbergi* in Subarea 48.3 and to the concern about the paucity of data on the role of myctophids in the Antarctic ecosystem and the need to consider the relative importance of these species as prey in the South Georgia region (Annex 5, paragraph 181).

5.21 Members were requested to submit information on the significance of myctophids, and especially *E. carlsbergi*, as prey for predators in the Convention Area, and especially in Subarea 48.3, to the next meeting of WG-CEMP.

Environmental Monitoring

5.22 The Scientific Committee noted the progress made by WG-CEMP in developing ways of collecting data on environmental features likely to have significant indirect or direct effects on predators and prey being monitored in CEMP.

5.23 In respect of environmental data collectable at land-based sites, Members involved in monitoring predator parameters are requested to collect data on meteorology and sea-ice according to the methods outlined in the document on Standard Approaches for Monitoring Environmental Parameters, which will be appended to the booklet on Standard Methods for Monitoring Parameters of Predatory Species.

Prey Requirements of Predators

5.24 The Commission supported a request of the Scientific Committee (SC-CAMLR-VIII, paragraphs 5.26 and 5.27) for Members to synthesise data on predator population size, diet and energy budgets in order to provide estimates of krill requirements of predators in Integrated Study Regions. Advice on how best to proceed towards this goal had been requested from, and provided, by the SCAR Subcommittee on Bird Biology and Group of Specialists on Seals (SC-CAMLR-IX/BG/18).

5.25 In addition, two papers were prepared describing models of potential value in estimating food consumption of predators in the South Georgia and Antarctic Peninsula Integrated Study Regions (WG-CEMP-90/30 and 31).

5.26 The Scientific Committee endorsed the views of WG-CEMP on the constructive advice provided by the SCAR groups and the substantial potential of the tabled models for providing the information required by the Scientific Committee and Commission.

5.27 It supported the proposals for future action (Annex 6, paragraphs 136 and 137), particularly the development of detailed proposals for a workshop and the request to Members to collect and make available relevant data.

Awareness of CEMP

5.28 In response to requests to promote awareness of CEMP among CCAMLR Members and in the Scientific community generally, the Secretariat had been asked to prepare an article describing the aims, principles and operations of CEMP.

5.29 This document had been reviewed and approved by WG-CEMP which had recommended that the revised version (SC-CAMLR-IX/8) should be published (in the four languages of the Commission) as the text of an information brochure, accompanied by a selection of relevant illustrations. The Scientific Committee endorsed this recommendation.

Designation and Protection of Sites

5.30 WG-CEMP had reviewed proposals for the designation of CEMP Monitoring Sites at Magnetic Island, Cape Shirreff, Livingston Island and Seal Islands. It notified the Scientific Committee that, with certain minor modifications, these conformed to the guidelines suggested by the Scientific Committee (SC-CAMLR-VII, paragraphs 5.19 and 5.20) and endorsed by the Commission (CCAMLR-VII, paragraph 78).

5.31 The Scientific Committee regretted that the revised versions had not been attached to the report of WG-CEMP, nor officially transmitted to Members in advance of this Meeting of the Scientific Committee, thereby preventing examination and discussion by national organisations in some Member countries.

5.32 The Scientific Committee agreed that the revised versions for Magnetic Island and Cape Shirreff conformed to the guidelines referenced in paragraph 5.30 above. The Seal Islands proposal, however, required a modification in the title of the proposal and the production of an accurate map, including geographical coordinates. The Scientific Committee agreed that, subject to the corrections indicated above, all three proposals met the existing guidelines; it agreed to notify the Commission accordingly.

5.33 Further action would await a decision by the Commission as to how it wished to proceed with the formal designation and protection of land-based CEMP sites.

Future Meetings

5.34 The Scientific Committee agreed with the recommendation of the Working Group that an intersessional meeting in 1991 would be desirable.

5.35 The Scientific Committee strongly endorsed (and drew to the Commission's attention) the request by WG-CEMP that more Member countries should be involved in the work of WG-CEMP, especially through participation at its meetings.

Data Requirements

5.36 In the WG-CEMP report, there are several requests for information and data additional to those already identified in previous sections (paragraphs 5.13 to 5.15, 5.17, 5.20, 5.21, 5.23 and 5.27). The attention of Members is drawn particularly to those on:

(i) submission of methodological protocols relating to age-specific annual survival and recruitment (Annex 6, paragraph 60);

(ii) evaluation of whether foraging trip data should be collected for one or both penguin parents (Annex 6, paragraph 63);

(iii) actual and potential effects of monitoring procedures (Annex 6, paragraph 82); and

(iv) the preparation by the Secretariat of a paper on analysis techniques relevant to CEMP for summary data on sea-ice distribution (Annex 6, paragraph 118).

Advice to the Commission

5.37 The Scientific Committee informs the Commission that now the protocols for submission of data to the CCAMLR Data Centre from CEMP predator monitoring programs have been agreed and following the Commission's decision at CCAMLR-VIII (paragraph 57), Members have an obligation under Article IX of the Convention to submit relevant data annually by 30 September.

5.38 For reasons set out in paragraph 5.15, the Scientific Committee requests the Commission to change the above annual reporting date to 30 June.

5.39 In response to the Commission's request for advice and progress in relation to issues identified in conjunction with Working Group for the Development of Approaches to Conservation of Antarctic Marine Living Resources (WG-DAC), WG-CEMP has provided comments on operational definitions of depletion (Annex 6, paragraph 35) and the ability of CEMP to detect and interpret change (Annex 6, paragraph 36). In particular, it has developed explicit procedures for evaluating the CEMP predator data in order to provide advice to the Scientific Committee and Commission. The Commission is requested to endorse these developments.

5.40 In response to the Commission's request that Members synthesise data on population size, diet and energy budgets in order to estimate krill consumption by seabirds and seals in Integrated Study Regions, WG-CEMP had made excellent initial progress. It expects to develop proposals for a workshop, designed to provide specific detailed responses to the Commission's requirements, during the intersessional period.

5.41 The Commission is asked to approve the publication of an information brochure (see paragraph 5.29) on the CEMP based on SC-CAMLR-IX/8.

5.42 The Scientific Committee recommends that a meeting of WG-CEMP during 1991 would be desirable.

5.43 The Scientific Committee draws to the Commission's attention the development, according to the guidelines suggested by the Scientific Committee and endorsed by the Commission at its Seventh Meeting, of management plans for three CEMP Monitoring Sites.

5.44 The Commission is requested to encourage more Member countries to become involved in the work of WG-CEMP and in particular to participate in its meetings.

CCAMLR/IWC Workshop on Feeding Ecology of Southern Baleen Whales

5.45 This Workshop was intended to permit a functional evaluation of the minke whale as a potential indicator of changes likely to result from harvesting of krill.

5.46 In 1988 a Joint CCAMLR/IWC Steering Committee prepared terms of reference and a comprehensive list of workshop topics and pre-workshop tasks (SC-CAMLR-VII/BG/9).

5.47 The CCAMLR Scientific Committee noted this Steering Committee's recommendations for review papers and background documents to be prepared in advance of the meeting and provided detailed instructions for the CCAMLR Co-conveners (Mr D. Miller, South Africa and Dr J. Bengtson, USA) to arrange this (SC-CAMLR-VII, paragraphs 5.48 to 5.51). In correspondence with IWC, a meeting date in September 1989 was agreed.

5.48 In November 1988, the CCAMLR Co-conveners solicited pre-workshop contributions from nine scientists on six topics (SC-CAMLR-VIII/8). In late March 1989, however, the IWC Co-convener informed CCAMLR that IWC contributors would be unable to undertake their allocated tasks. The meeting was deferred until IWC contributions were sufficiently advanced to allow the Workshop to be rescheduled (SC-CAMLR-VIII, paragraph 5.36).

5.49 In August 1990, the IWC Secretary informed CCAMLR 'that the terms of reference and participants for the Joint Workshop on the Feeding Ecology of Southern Baleen Whales should be expanded to cover studies of other major predators of krill, especially those pertinent to estimates of abundance and trends' and that a joint workshop should be planned for 1992 (SC-CAMLR-IX/BG/12).

5.50 The Scientific Committee was surprised that the letter from IWC did not indicate why the original terms of reference and the detailed workshop plans (to which CCAMLR had devoted considerable time and effort) were no longer appropriate.

5.51 The IWC suggestion for a workshop expanded to cover all major predators on krill was, in the Scientific Committee's view, entirely inappropriate for a joint CCAMLR/IWC workshop. The Scientific Committee reaffirmed that the original terms of reference and workshop plans were still entirely appropriate to CCAMLR's interest and recommended that the Executive Secretary write to IWC in these terms.

5.52 As it was clear that even a workshop on the original topic could not now be held until 1993, the Scientific Committee suggested that WG-CEMP should consider an interim review, (perhaps in 1992) of the minke whale as a potential indicator of changes likely to result from harvesting of krill. Essential to such a review, would be contributions (as background papers) along the lines of those originally solicited in SC-CAMLR-VIII/8.