ECOSYSTEM MONITORING AND MANAGEMENT

Report of the Convener of the Working Group for CEMP

5.1 Dr K.R. Kerry (Australia) presented the Report of the Working Group's Intersessional Activities in 1987/88 (Annex 7). The Working Group did not meet during this period but conducted work by correspondence and within the Secretariat, particularly on the tasks identified by the Scientific Committee at its last meeting and described in SC-CAMLR-VI, paragraph 7.39. The rRport was used as a basis for discussion of the current and future work of the Working Group.

Standard Methods for Monitoring Parameters of Predator Species

5.2 The methods to be used in monitoring the parameters of predatory species approved last year for inclusion in the CEMP (SC-CAMLR-VI, Annex 4, Appendix 4) were revised, published (in English; translation into other languages is in progress), circulated to all Commission Members and other appropriate organisations.

5.3 These instructions will need revision in the light of operators experiences of using them in the field. Members are urged to convey suggestions for improvements to the Convener of the Working Group, so that he may arrange periodic review of the existing instructions, following which the Secretariat can issue revisions as necessary.

5.4 It was noted that the binding of the published booklet does not facilitate replacement of existing instructions with new ones. However, the Secretariat informed the Scientific Committee that it had felt obliged to select the cheapest binding for the initial printing run.

Summary of Members' CEMP Activities

5.5 A number of nations have initiated research as part of the CEMP. These efforts by national programs were welcomed by the Scientific Committee and are summarised in Annex 7.

5.6 To facilitate further co-ordination of Members' contributions to CEMP, the Scientific Committee noted that it is important that Members be informed of each others plans and activities. In this regard, most reports of Members' CEMP activities were deemed insufficiently explicit to assist the Working Group and the Scientific Committee in evaluating the precise

nature of current and projected work on the predator parameters recommended for monitoring and on directed research, or to provide essential background information to potentially suitable parameters (SC-CAMLR-VI, paragraph 7.21).

5.7 To remedy this, the Convener, in conjunction with the Secretariat, was asked to prepare a new set of reporting sheets for Members' CEMP activities. This would be circulated for comment during the current meeting, completed by Members as soon as possible thereafter and returned to the Secretariat not later than 30 November, in order to ensure inclusion in the Appendix to the Convener's Report. A list of all tabled papers relevant to CEMP work would also be appended to this Report (Annex 7).

Data Reporting Formats for Existing Approved Predator Monitoring Operations

5.8 Draft formats for seabird parameters, developed by the Convener and the CCAMLR Data Manager, were tabled at the present meeting (SC-CAMLR-VII/BG/8).

5.9 It is important to reach early agreement on the format and use of these forms to enable Members to submit to CCAMLR data from their current monitoring operations.

5.10 Therefore draft formats for fur seal parameters should be prepared immediately by the Working Group Convener and CCAMLR Data Manager. The complete set of draft seabird and seal data reporting forms should be circulated to Members before 30 November. Members' responses should be received by the Secretariat by 1 March.

5.11 Guidelines and requirements for submitting ecosystem monitoring data to the Secretariat have not yet been agreed. The Scientific Committee did, however, agree that the Working Group for CEMP should discuss this topic and develop guidelines at its 1989 intersessional meeting.

Registration and Protection of Approved Land-Based Monitoring Sites

5.12 Last year the Working Group indicated that long-term shore-based monitoring of predator parameters would be helped if approved sites were accorded some form of protection (SC-CAMLR-VI, paragraph 7.18).

5.13 The need to provide protection arose from concern that unregulated human activity at monitoring sites could prejudice the efficient conduct of the monitoring operations and create additional sources of variation in the parameters being measured.

5.14 The Scientific Committee asked the Commission to consider how formal protection might best be achieved, taking account of procedures available within Article IX, paragraph 2, sub-paragraph (g) of the Convention and the existing systems of site protection under the Antarctic Treaty (SC-CAMLR-VI, paragraph 7.32).

5.15 The Scientific Committee asked the Convener of the Working Group for CEMP, in conjunction with the Secretariat to consider appropriate action in respect of registration and protection for approved CEMP land based monitoring sites (SC-CAMLR-VI, paragraph 7.39(ii)).

5.16 The Commission noted that work on developing management plans for land based CEMP sites would be submitted for consideration at the next meeting (CCAMLR-VI, paragraph 55). It agreed that in developing these plans the term 'human interference' would not be interpreted to include fishing.

5.17 After considering the paper prepared by the Convener of the Working Group for CEMP and the Secretariat (SC-CAMLR-VII/3 Rev. 1), the Scientific Committee made the following suggestions (paragraphs 5.18 to 5.20) for the consideration and guidance of the Commission.

5.18 All sites where land based CEMP studies are underway or planned for the near future should be properly defined and registered as sites for CEMP monitoring.

5.19 Proposals for the registration of these sites should include:

(i) a clear description of the location and the key physical and biological features of the site, including a description of the markers and/or natural features that delineate the site and any proposed buffer zone(s) adjacent to the site;

(ii) a map and/or photographs showing the boundaries and key features of the proposed site and any adjacent buffer zone(s);

(iii) a description of the objectives and nature of CEMP monitoring studies being conducted or planned to be conducted at the site, including the species and parameters being monitored;

(iv) descriptions, as applicable, of any SSSIs, SPAs, historic monuments, and research of other facilities in or near the proposed CEMP site and any protective measures already applicable in or near the site as a result of actions taken previously under the Antarctic Treaty;

(v) a description, as applicable, of steps that have been or are being taken to ensure that the proposed listing will in no way reduce or compromise protection of areas afforded special protection under components of the Antarctic Treaty System, and

(vi) a draft management plan.

5.20 Draft management plans for proposed CEMP land-based sites and any adjacent buffer zones should include:

(i) the name, title, and mailing address of the individual and/or organisation responsible for planning and conducting CEMP studies at the proposed site;

(ii) description of the types of activities that could be conducted in or near the proposed CEMP site, at different times of the year, without jeopardising the ongoing or planned monitoring studies;

(iii) descriptions of the types of activities (including activities outside the site) that could impair or jeopardise the ongoing or planned monitoring studies;

(iv) descriptions of steps that should be taken to minimise damage or interference in cases where access to the CEMP study site is essential for other purposes (e.g. indicate anchor sites, access points, pedestrian routes, etc. that would avoid or minimise disturbance). This is one of the key elements of the management plan and should be specific and detailed; and

(v) the date when CEMP studies at the site are expected to be concluded. Many CEMP studies necessarily will be carried out for indefinite periods of time and it therefore will be impossible to anticipate when the studies might be concluded. In these cases, the results of the studies should be reviewed periodically (e.g. at five year intervals) and the approved management plan updated accordingly.

Sensitivity Analyses on Estimates of Predator
Parameters Derived from Existing Data

5.21 Progress on this, beyond preparing summaries of potentially useful data sets, had been retarded by difficulties in defining the tasks in sufficient detail to develop appropriate analytical procedures.

5.22 From discussions at the meeting, it was agreed that there were at least four main topics of relevance. These are:

(i) a description of some of the statistical properties of the parameters being monitored (e.g. statistical distributions of parameter estimates; sample sizes to achieve desired levels of precision);

(ii) the power to detect differences in point estimates and to detect trends (e.g. the size of differences that can be detected between areas; the number of years that monitoring must be continued to detect a certain constant rate of change in the parameter);

(iii) the power to detect inter-dependencies, which might be time and space varying and non-linear (e.g. how does the trade-off between the number of penguin colonies sampled, and the intensity of sampling at each, change the ability to use inter-annual variability of krill to distinguish possible relationships between breeding success and krill abundance?); and

(iv) the potential adequacy of the data and estimates to meet the requirements of CCAMLR in distinguishing between natural variations in prey abundance and those induced by fishery activity.

5.23 While each of the above issues is important to the role of the Ecosystem Monitoring Program, it is also clear that they differ considerably in the ease with which they can be addressed. Many aspects of points (i) and (ii) can be examined with existing data and standard methodologies. There appear to be some data available for examining (iii), and the examination would in some cases require simulation studies. Examination of point (iv) would probably involve modelling studies, and would probably require evaluating how information from the Ecosystem Monitoring Program might be used by CCAMLR in the management of fisheries.

Standardisation of Sampling Design for Prey Monitoring

5.24 Limited progress has been made towards this important objective. However, the Scientific Committee noted the conclusions in the review of Members' responses on this topic (SC-CAMLR-VII/5):

(i) theoretically it is feasible to monitor krill in support of the predator monitoring studies agreed by CEMP;

(ii) proposed survey methods have been outlined (SC-CAMLR-VI/BG/8) which should be tested by simulation studies and also in the field; and

(iii) more information is needed on the depth distribution and degree of aggregation of krill with respect to time of day, geographical position and physical variables.

5.25 The review of hydroacoustic surveys in the Prydz Bay region, conducted during the BIOMASS Program (SC-CAMLR-VII/BG/40) provides additional relevant information on ways to improve the accuracy and precision of hydroacoustic surveys.

5.26 The main immediate requirements, in the context of prey monitoring to aid interpretation of predator parameters, are therefore:

(i) advice on appropriate survey design, frequency and duration;

(ii) standard methods for the technical elements of prey monitoring surveys about which there is general agreement (e.g. basic hydroacoustic techniques, net haul validations of targets etc.); and

(iii) results of field studies designed to investigate relationships between krill aggregations and distributions and time of day and other environmental variables.

5.27 There is also a need to continue to consider how trawl and other surveys might be used in quantitative monitoring of prey abundance.

Future Work of the Working Group for CEMP

5.28 The Scientific Committee reviewed the various tasks facing members in respect of the CEMP in order to identify the best ways of undertaking these.

Existing Approved Predator Parameters

Evaluation of Sites and Methods

5.29 (i) The Working Group for CEMP will review at its next meeting the list of selected and suggested sites where these parameters should be monitored. At that time, consideration will be given to the comments provided by the SCAR Sub-committee on Bird Biology (SC-CAMLR-VII/12, page 14);

(ii) formal registration and protection of sites approved for monitoring predator parameters will proceed according to any procedures and guidelines established by the Commission (see paragraphs 5.12–5.16);

(iii) Members collecting data using the standard method sheets should inform the Working Group Convener of desirable improvements. He should then proceed as indicated in paragraph 5.3; and

(iv) the Working Group for CEMP will review the standard methods in the light of (iii) above and of statistical evaluations ('sensitivity' analyses) of the type indicated in paragraph 5.22 subparagraphs (i) and (ii).

Data Recording, Reporting and Analysis

5.30 (i) The draft forms developed by the Convener and Secretariat to assist members record data on approved parameters in the field (i.e. prior to summarising it on the Data Reporting Forms) should be circulated to Members for comment as soon as possible. The Working Group should revise these forms by correspondence and conduct a final review at their next meeting;

(ii) Members are requested to review, as set out in paragraphs 5.9 and 5.10, the draft formats intended for submitting data to the Secretariat. Data submission formats will be discussed and adopted by the Working Group at its next meeting; and

(iii) the Working Group for CEMP, in consultation with the CCAMLR Data Manager, will develop appropriate guidelines for the submission, validation, storage, access and analysis of data. To expedite discussions of this topic at the next meeting of the Working Group, the Data Manager was requested to consult with organisations already possessing relevant experience with these types of data and to prepare a report for the next meeting of the Working Group, proposing possible protocols for the CEMP.

Parameter Evaluation

5.31 To permit critical evaluation on the limitations of the present approved parameters, sensitivity analyses have been recommended. Members are asked to conduct the analyses outlined in paragraphs 5.22 (i) and (ii) on their own data sets and to report the results of this to the Convener, if possible in the form of a tabled paper for the next meeting of the Working Group. The Working Group Convener will consult with the Data Manager and other appropriate experts to provide Members, as soon as possible, with explicit instructions for the exact nature of the analyses required.

Directed Research

Potential Predator Monitoring Parameters

5.32 Members were reminded of the recommendation to report to the Working Group the results of evaluations of the potential for CEMP of additional monitoring parameters and the relevance of new technological advances (SC-CAMLR-VI, Annex 4, Table 4).

5.33 Members were encouraged to prepare such evaluation reports. It would be very helpful if any being prepared during the forthcoming year were made available to the Convener of the Working Group in advance of its next meeting.

Background Information Needed for Interpreting
Changes in Monitored Predator Parameters

5.34 Members were encouraged to prepare reports on their research into the topics listed in SC-CAMLR-VI, Annex 4, Table 8 in advance of the next meeting of the Working Group.

Environmental Data Requirements

5.35 At its last meeting, the Working Group prepared a fairly comprehensive list of environmental data requirements to interpret predator–prey relationships (SC-CAMLR-VI, Annex 4, Table 6).

5.36 It was agreed that it would be very useful if the Working Group could start to develop appropriate standard method sheets for the environmental parameters deemed suitable to monitor now.

5.37 The Working Group should review environmental data requirements at its next meeting. To help in developing standard methods, the Convener was asked to request Members to provide information on methods currently in use to record these parameters.

5.38 The Working Group had previously noted the potential considerable value of imagery and data derived from satellite missions in providing information on environmental variability in and around the Integrated Study Regions and network sites (SC-CAMLR-VI, Annex 4, paragraph 36). It asked Dr Feldman (an invited expert to the 1986 Meeting of the Working Group) to investigate availability of appropriate environmental data (SC-CAMLR-VI, paragraph 7.13). The Working Group made a commitment to review, at its next meeting, the results of individual scientists' collaboration in this field with Dr Feldman. The Convener was asked to contact Dr Feldman to assess progress and also to make appropriate preparations for the review.

5.39 The draft plans for net sampling efficiency studies, production of which was to be co-ordinated by Dr Sherman (SC-CAMLR-VI, Annex 4, paragraph 63), should be circulated as soon as possible.

Prey Monitoring

5.40 A priority task within CEMP should be to develop prey monitoring operations to aid interpretation of predator parameters. Bearing in mind earlier discussions (paragraph 5.26), the Scientific Committee recommended the following procedure:

(i) the Working Group for CEMP should identify the characteristics of predators that need to be taken into account in prey survey design (SC-CAMLR-VII/5 provides some relevant examples);

(ii) simulation studies are likely to be particularly useful in generating advice on survey design, frequency and duration. Work including modelling krill distribution and behaviour is being undertaken within the Krill CPUE Simulation Study. The Working Group for CEMP should consult with the Working Group on Krill to develop this, and other relevant studies, to provide appropriate advice; and

(iii) the Working Group on Krill should arrange the production of standard method sheets for the technical aspects of prey surveys.

General

Co-ordination of Research in Integrated Study Regions

5.41 The report of the Convener identified a particular need for co-ordination of research between the numerous groups conducting monitoring operations at different sites (e.g. at King George Island* , South Shetland Islands) within the Antarctic Peninsula Integrated Study Region. The next meeting of the Working Group would provide a good opportunity for discussing this in detail. The Convener was asked to draw this matter to the attention of the relevant Members and to solicit suggestions on how best to proceed.

* Known in Argentina as Isla 25 de Mayo.

Analysis of Inter-dependence between Sampling Methods and Results of Predator Monitoring and Changes in Prey Abundance

5.42 Earlier discussions (paragraphs 5.22 (iii) and 5.23) indicated the need to evaluate the availability of data relevant to undertaking such analyses and the probable need for simulation studies.

5.43 Members were requested to:

(i) identify precised questions relating to analyses of these types of inter-dependent relationships;

(ii) to suggest appropriate analyses for investigating these relationships;

(iii) indicate which data are needed adequately to conduct such analyses; and

(iv) indicate the extent to which such data are currently available.

The Working Group should review this information at its next meeting.

Relevance of CEMP to CCAMLR Management Strategies

5.44 It was noted earlier (paragraph 5.23) that CCAMLR will need to consider how information from CEMP might be used in the management of fisheries in the Convention Area. The Scientific Committee would welcome relevant advice from its working groups on this topic.

Report of the Meeting of the Steering Group of the CCAMLR/IWC Sponsored Workshop on the Feeding Ecology of Southern Baleen Whales

5.45 The Steering Group for the Joint CCAMLR/IWC Workshop met in May 1988 in San Diego. The CCAMLR Scientific Committee was represented by Mr D. Miller (South Africa) and Dr Y. Shimadzu (Japan). Their report (SC-CAMLR-VII/BG/9) notes that the terms of reference and detailed focus of the proposed Workshop should ensure a functional evaluation of the minke whale as a potential indicator of changes likely to result from harvesting of krill.

5.46 The Scientific Committee therefore agreed that it was appropriate for CCAMLR to continue to support this Workshop.

5.47 It agreed that Mr D.Miller and Dr J. Bengtson (USA) should be appointed as the Co-conveners to represent CCAMLR in the future planning and conduct of the Workshop. The IWC have appointed Dr J.L. Harwood as their Convener.

5.48 The terms of reference of the Workshop are set out in SC-CAMLR-VII/BG/9. To fulfil these, the Steering Committee recommended that a suite of review papers and background documents (including results of commissioned analyses) should be available at the Workshop.

5.49 From the list of such requirements in the Steering Committee's report, tasks that CCAMLR is in the best position to arrange implementation of are:

(i) review of available knowledge on krill biology, particularly its summer distribution in the Antarctic, diurnal movements, swarming and other aspects of its behaviour;

(ii) review of distribution of commercial krill fishing activities and catches within the Antarctic. This should also include plots of activities and catches on as fine a geographical scale as possible and by month, by season or seasons (1972 to present combined); and

(iii) distribution of krill swarms from scientific surveys, incidental observations etc.

5.50 The comprehensive list of requirements prepared by the Workshop Steering Committee for documentation prior to the meeting included two items of particular interest of CCAMLR:

(i) analysis of body condition (blubber thickness, girth, carcass lipid content) of baleen whales in relation to food availability; and

(ii) review of annual trends in growth and reproductive rates of Antarctic baleen whales.

5.51 The Scientific Committee asked the Co-conveners:

(i) to identify the scientist(s) best able to provide the review papers indicated above; and

(ii) to consult with the CCAMLR Data Manager as to the best way of producing the appropriate data summaries.

5.52 The IWC had received an offer from the United States Southwest Fisheries Center at La Jolla to host the Workshop, which IWC requested should be held between September and November, 1989.

5.53 The Scientific Committee felt that the venue was appropriate; to avoid clashes with other meetings and activities of the Scientific Committee the Workshop should be held in early September.

5.54 The IWC had indicated that the existing financial allocations would be inadequate to cover the costs of the Workshop, especially including commissioning of appropriate review papers and analyses, the attendance of invited experts and the publication of the proceedings.

5.55 The Scientific Committee proposes to meet the cost of translating and publishing of the Report of the Workshop in sufficient numbers to meet its own needs and contribute to the cost of participation of the invited experts. Estimates of the expenditures are given in Annex 9. The USA is contributing US$15 000 in addition to covering the administration and computing costs of the Workshop.

Advice to the Commission

5.56 The Scientific Committee recommends that the Working Group for CEMP meets in 1989 and that Argentina's offer to host this meeting, which should be held at a time immediately adjacent to that of the CCAMLR/IWC Workshop on the Feeding Ecology of Southern Baleen Whales, be accepted.

5.57 The Scientific Committee draws the attention of the Commission to its advice on registration and protection of CEMP land based sites. Full details are to be found in paragraphs 5.19 and 5.20.