ECOSYSTEM MONITORING AND MANAGEMENT

Working Group for the CCAMLR Ecosystem Monitoring Program

6.1 Dr K. Kerry (Australia), Convener, introduced the Report of the Working Group for the CCAMLR Ecosystem Monitoring Program Meeting held in Hamburg, 2–7 July 1986 (Annex 6). He thanked members of the Group for their participation and Mr D. Miller (South Africa) who had acted as Rapporteur.

6.2 The Working Group reaffirmed the background and rationale of the approach adopted by the Ad Hoc Working Group on Ecosystem Monitoring Meeting held in Seattle (6–11 May 1985) (SC-CAMLR-IV, Annex 7). The two main considerations were:

(i) The need to maintain ecological relationships between harvested and dependent (and related) species within the Convention Area,

and

(ii) The need to establish the important elements of a program to monitor ecosystem changes in the Convention Area.

Both (i) and (ii) were considered to require the extension of the existing baseline data, the possible establishment of new data baselines, and the identification of essential sub-programs for directed research.

6.3 The Working Group further recognised that in order to monitor the resource potential of individual species and detect any harvest-induced effects on key Antarctic marine species, it would be necessary to collect different types of data.

6.4 The Group endorsed the approach used at the Seattle Meeting in selecting the potential indicator species. An additional three species were selected:

Predator species: *Thalassoica antarctica* (Antarctic petrel)
Diomedea melanophoris (Black-browed albatross)

Prey Species: *Euphausia crystallorophias*, in selected areas.

6.5 The Group reaffirmed the most important areas identified at the Seattle Meeting for monitoring predator-prey interactions in the Southern Ocean system. These are:

- the Prydz Bay region (5868°S 55–85°E within CCAMLR Statistical Area 58.4.2) – representative of higher latitude Antarctic predator-prey interactions;

- the Antarctic Peninsula region (60–68°S 54–75°W within CCAMLR Statistical Areas 48.1 and 88); and

- the South Georgia region (53–56°S 35–40°W within CCAMLR Statistical Area 48.3) – representative of lower latitude predator-prey interactions.

The Group also agreed upon a proposed network of sites for monitoring and directed research.

6.6 The various parameters to be monitored that had been selected at the Seattle Meeting (Tables 3-5 in SC-CAMLR-IV, Annex 7) were reviewed. Additions to the list of parameters of potential immediate use were identified as were a number of additional parameters which required directed research. The Group recognised that the interpretation of many monitoring parameters requires quantitative information on the large-scale distributions and smaller scale spatial/temporal relations of predators with respect to their prey. Within this context, various parameters to assess rates of change in prey abundance (in particular, krill) were identified. Methods to be used for monitoring both predators and prey were discussed. A number of specific environmental variables thought to affect predator-prey species interactions, as well as predator and prey species dynamics separately were identified.

Practical Implementation and Co-ordination of the CCAMLR Ecosystem Monitoring Program

6.7 On the basis of the Working Group's report, the Scientific Committee reiterated the importance of establishing a long-term program to detect and record changes in critical components of the ecosystem as a basis for the conservation of Antarctic marine living resources (SC-CAMLR-IV, paragraph 7.2).

6.8 Following the last session, the Chairman wrote to the IWC Scientific Committee requesting information on the possible means whereby trends of Antarctic whale stocks might be assessed and whether minke whale or other cetaceans might function as useful

indicators of krill availability. The IWC Scientific Committee's response indicated that it was conducting a Comprehensive Assessment of whale stocks and that this assessment was expected to be completed by 1990. The response also indicated that there were differing views regarding the possible utility of minke whale as an indicator species.

6.9 The Scientific Committee expressed its thanks to the IWC Scientific Committee and noted that the Comprehensive Assessment should provide updated information on the status of Antarctic whale stocks and could help to assess the possible effects of krill fisheries on whales. The Scientific Committee therefore encouraged the IWC Scientific Committee to complete the Comprehensive Assessment as rapidly as possible.

6.10 It was noted that the Workshop on the Feeding Ecology of Southern Baleen Whales proposed by the IWC Scientific Committee in 1983 would address issues of importance to both the IWC and CCAMLR. The Scientific Committee recommended that further consultations be undertaken to facilitate joint planning and early scheduling of this workshop.

6.11 It was agreed that the Chairman of the Scientific Committee, in consultation with the Convener of the Working Group on Ecosystem Monitoring, would write to the IWC Scientific Committee to:

(a) determine how the Comprehensive Assessment might contribute to evaluating the nature of and possible means for detecting the effects of krill harvest on Antarctic whale stocks,

(b) explore means for analysing available data and information assembled during the Comprehensive Assessment on physiological condition, stomach contents, and feeding behaviour of minke whales in terms of the utility for indicating changes in the krill/whale system, and

(c) identify what further steps might be taken to co-operatively plan and convene a Workshop on the Feeding Ecology of Southern Baleen Whales.

6.12 In terms of implementing studies on other important predator species, the Committee requested the Convener to communicate with the SCAR Group of Specialists on Seals and the Sub-Committee on Bird Ecology to provide advice on the precise sampling protocols and sample sizes required for the effective monitoring of parameters identified by the WG. This would provide information on the timing of investigations and the minimum time required to establish adequate baseline data sets for future assessments of system changes. The

Committee appreciated that much of the necessary information was contained in various handbooks already published under the auspices of BIOMASS (as summarised in SC-CAMLR-V/BG/12) or other SCAR publications (e.g. the book on seal research methodology currently being formulated by the SCAR Group of Specialists on Seals). It also recognised that the newly formed SCAR Group of Specialists on Southern Ocean Ecology could play an important role in the future integration of studies on both predators and prey.

6.13 The Scientific Committee reaffirmed the urgent need to commence the practical implementation of the Ecosystem Monitoring Program. The Committee agreed that the Working Group should meet during the inter-sessional period in Paris (10–16 June 1987), directly after the CCAMLR/IOC Scientific Seminar on Antarctic Ocean Variability and its Influence on Marine Living Resources, Particularly Krill. Important topics to be addressed at this meeting would include:

- data needs, data acquisition and data handling in respect of predator, prey, environmental and fisheries variables;
- standardisation of monitoring methods;
- identification and elaboration of new methods;
- the potential role of remote sensing technology in terms of monitoring important parameters;
- theoretical aspects and pilot studies as related to monitoring needs and methodologies;
- establishing a schedule for various program elements.

6.14 In order to facilitate co-ordination of the program, a summary of Members' Activities (present and planned) was drawn up (see Annex 7). It was agreed that this table would provide a useful basis for discussion at the intersessional meeting of the Working Group.

6.15 With respect to evaluating the potential usefulness of remote sensing technology and telemetry for monitoring needs, the Committee agreed that at least 1 ½ days of the above scheduled inter-sessional meeting should be devoted to a detailed appraisal of currently available techniques as well as pertinent future developments in the field. It was recognised that in general, experience and expertise in the field are currently limited. For this reason the

Committee felt that it was important that suitable specialists (up to approximately three in number) should be invited to the meeting to advise the Working Group on the development of appropriate remote sensing equipment to meet monitoring needs.