

## SCIENTIFIC COMMITTEE

### Report of the Scientific Committee

4.1 Decisions of the Commission relating to conservation measures arising from recommendations of the Scientific Committee are reported in section 8 of this report. The Commission endorsed the recommendations, advice, data requirements and research plans of the Scientific Committee, unless otherwise stated.

4.2 In his introduction to the report, the Chairman of the Scientific Committee, Dr K.-H. Kock (Germany), pointed out that CCAMLR has become a pioneer in the development of precautionary approaches to management. The Commission noted that it is important that CCAMLR continue to work at the forefront of world development of precautionary approaches to the management of marine resources (see also paragraph 9.1).

#### Fishery Status and Trends

4.3 The Commission noted that one Panamanian vessel was reported to have caught 637 tonnes of krill from mid-June to mid-July 1995 in Subarea 48.3. Panama is not a Member of CCAMLR. The Commission agreed to draw Panama's attention to the various requirements and related monthly data reporting provisions set out in Conservation Measure 32/X as related to krill (SC-CAMLR-XIV, paragraph 2.4).

4.4 The Commission endorsed the recommendation of the Scientific Committee that in accordance with Article X of the Convention the Commission should encourage any State which is not a Party to CCAMLR to join the Commission and to comply with conservation measures currently in force (SC-CAMLR XIV, paragraph 2.6).

4.5 The Commission noted the increasing interest in fishing for *D. eleginoides* in the Convention Area (SC-CAMLR-XIV, paragraphs 2.13 to 2.24) and that the Scientific Committee had reported that fishing for krill was likely to continue at similar levels to that in 1994/95 (SC-CAMLR-XIV, paragraphs 2.1 to 2.12). In addition to the information presented in the Scientific Committee's report, the Republic of Korea reported that one Korean fishing company had recently expressed an interest in fishing for krill in the Convention Area. Korea last fished for krill in the 1991/92 season.

## Dependent Species

### CEMP

4.6 The Commission congratulated the Scientific Committee on the considerable progress it was able to make on monitoring methods and data acquisition for the CCAMLR Ecosystem Monitoring Program (SC-CAMLR-XIV, paragraphs 3.4 to 3.16) and endorsed its data requirements (SC-CAMLR-XIV, Annex 4, section 8). It further endorsed the Scientific Committee's decision to establish a subgroup on the further development of monitoring methods and a subgroup on statistics (SC-CAMLR-XIV, paragraphs 3.15 to 3.17) in order to be able to cope with the increasing workload relating to the development of new methods and the potential revision of all methods, and to improve analysis, interpretation and presentation of the CEMP indices.

4.7 There were no specific proposals for CEMP site protection. Norway intends to nominate Bouvet Island as a CEMP monitoring site in the future. US shore-based operations at Seal Island were being discontinued because the site of the field station was unsafe. A new site is being sought in the Antarctic Peninsula so that the land-based work can continue (SC-CAMLR-XIV, paragraphs 3.20 to 3.22).

### Marine Mammal and Bird Populations

4.8 The Commission noted the Scientific Committee's discussion on the report of SCAR's 1995 Antarctic Pack Ice Seals (APIS) Program planning meeting (Seattle, USA, 7 to 9 June 1995) which was partly funded by CCAMLR. The Commission recalled earlier recommendations (CCAMLR-XII, paragraph 4.40; CCAMLR-XIII, paragraph 3.16) and encouraged the continuation of the Scientific Committee's close liaison with SCAR during the planning and implementation of the APIS Program (SC-CAMLR-XIV, paragraphs 3.64 to 3.69) in order to encourage developments of relevance to CCAMLR and especially its ecosystem monitoring program.

4.9 At its Sixth Meeting, the Scientific Committee decided to ask SCAR to provide CCAMLR with a report on the status of Antarctic seal and seabird populations and to update this report every three to five years. Reports were received and discussed in 1988 and 1992. The Commission endorsed the Scientific Committee's decision to address a similar request to SCAR's Group of Specialists on Seals and the Subcommittee on Bird Biology again in 1996 and

to ask the IWC to provide a report on the status of whales in the Southern Ocean. Any reports received will be reviewed at the 1996 meeting of the Scientific Committee (SC-CAMLR-XIV, paragraph 3.70).

## Harvested Species

### Krill

4.10 The Commission noted the Scientific Committee's progress in relation to methods for assessing krill distribution and abundance (SC-CAMLR-XIV, paragraphs 4.10 to 4.18), in particular the large number of surveys of krill planned for the forthcoming season (SC-CAMLR-XIV, paragraphs 4.1 to 4.9).

4.11 The Commission noted that the Scientific Committee's current best estimate of  $B_0$  for krill is 35.4 million tonnes in Area 48 and 3.9 million tonnes for Division 58.4.2. Both estimates are based on FIBEX survey results (SC-CAMLR-XIV, paragraph 4.27). However, it also noted the Scientific Committee's conclusion that a new synoptic survey of krill in Area 48 would be desirable (SC-CAMLR-XIV, paragraph 4.16), and endorsed the Scientific Committee's recommendation that plans for such a survey be developed (SC-CAMLR-XIV, paragraph 4.26).

4.12 The Commission noted that a number of assumptions are included in the calculations the Scientific Committee has made to obtain estimates of krill yield (SC-CAMLR-XIV, paragraph 4.28). The explanation of these assumptions is not always easy, but it is critical to understanding of the limitations of the calculations. For instance, spatial characteristics of krill distribution are not modelled.

4.13 The Commission strongly endorsed the Scientific Committee's initiative in planning a high-quality booklet describing in layman's terms the CCAMLR approach to ecosystem monitoring and management (SC-CAMLR-XIV, paragraph 5.8), which should include an explanation of all the assumptions used in the calculation of yields.

4.14 The Commission agreed that CCAMLR had a strong interest in a symposium on the biology and ecology of krill and related species, planned for 1997 or 1998, and endorsed the Scientific Committee's recommendation to make a financial contribution of around A\$11 500 in order to support the symposium. This financial contribution should be included in the Scientific Committee's budget in 1996 or 1997 (SC-CAMLR-XIV, paragraph 4.24).

## Fish Resources

4.15 The Commission welcomed the considerable progress the Scientific Committee and WG-FSA were able to make this year in assessing *D. eleginoides* in Subarea 48.3.

4.16 The Commission noted that for the first time WG-FSA had estimated the level of unreported catch from the Convention Area and adjacent banks (SC-CAMLR-XIV, paragraph 4.40, Table 3). The unreported catch was either of the same order or higher than the reported catch. It was acknowledged that although the estimates of unreported catches had been possible this year, such estimates would not necessarily be possible in the future. Australia pointed out that where similar estimations have been performed in other fisheries the sources of information on unreported catch have often disappeared or become less reliable.

4.17 The Commission noted with satisfaction that the new approach used by WG-FSA in its assessment, in particular the use of the generalised yield model, gave results far superior to those obtained from previously conducted assessments, because it takes uncertainty in a number of input parameters specifically into account (SC-CAMLR-XIV, paragraphs 4.41 to 4.42).

4.18 The Commission endorsed the Scientific Committee's conclusion that an  $F_{0.1}$  harvesting strategy was not appropriate for this fishery, because it does not take uncertainty and variability in recruitment into account. It noted that WG-FSA had demonstrated that harvesting at  $F_{0.1}$  over the period of the projection would in fact result in a high probability of depletion of the spawning stock (SC-CAMLR-XIV, paragraph 4.45).

4.19 The Commission endorsed the application of the  $\alpha_1$  decision rule to *D. eleginoides* in Subarea 48.3. The  $\alpha_1$  decision rule has already been applied to krill, and to fish stocks around Heard and McDonald Islands (SC-CAMLR-XIII, paragraph 10.3). However, the Commission noted that the Scientific Committee had discussed the general appropriateness of the probability level (10%) used in the  $\alpha_1$  decision rule, particularly in relation to whether the same probability level should be used for resources with very different life histories (such as krill, which is relatively short-lived, and *D. eleginoides*, which is relatively long-lived). It acknowledged that the choice of a probability level was both a scientific and policy question. The Commission endorsed the recommendation of the Scientific Committee that WG-FSA give this matter detailed scientific consideration at its next meeting, including the possibility of presenting a wider range of options corresponding to different levels of risk (SC-CAMLR-XIV, paragraph 4.48).

4.20 The Commission noted that little progress had been made in the development of a longterm management plan for *Champtocephalus gunnari*, requested by the Commission last

year (CCAMLR-XIII, paragraph 8.38). The Commission reiterated the need for such a plan, especially in the light of uncertainty in many stock parameters (SC-CAMLR-XIV, paragraph 4.66), and requested that the Scientific Committee consider it a priority.

4.21 The Commission endorsed the Scientific Committee's advice in respect of stocks in Division 58.5.1 (SC-CAMLR-XIV, paragraphs 4.84 to 4.89). It noted that fishing for *D. eleginoides* is taking place on the western slope, northern shelf and a recently discovered ground on the eastern shelf of the Kerguelen plateau, and endorsed the catch limits set by France for these fisheries. It also endorsed the recommendation that haul-by-haul data be acquired from the longline fishery and that the Secretariat acquire haul-by-haul data from Ukraine for previous years in order to undertake further analyses on the stocks in which both the longline and trawl fisheries are based.

4.22 The Commission endorsed the Scientific Committee's recommendation that the *C. gunnari* fishery in Division 58.5.1 be closed until at least the 1997/98 season, when the 1994 cohort will have had the opportunity to spawn, and that a pre-recruit biomass survey be conducted in the 1996/97 season (SC-CAMLR-XIV, paragraphs 4.82 and 4.83). The fisheries for *N. rossii* and *L. squamifrons* should remain closed (SC-CAMLR-XIV, paragraph 4.78).

4.23 Further discussion of the Scientific Committee's consideration of fish stocks is given in section 8.

#### Other Matters

4.24 The Commission noted the Scientific Committee's discussions on the development of a World Wide Web (WWW) site at the Secretariat, and the consequences of the increasing workload for data management at the Secretariat (SC-CAMLR-XIV, paragraphs 3.24 and 10.5 to 10.11). The Commission requested that the Scientific Committee keep both these topics under close review. It endorsed the Scientific Committee's recommendation for increased staff to assist with scientific observer data (SC-CAMLR-XIV, paragraph 9.8) and the purchase of a fast workstation to assist with assessments (SC-CAMLR-XIV, paragraph 10.10).

4.25 The Commission acknowledged that increasing workloads for data management might lead to increased budget requirements in this area. It was emphasised that the Secretariat should continue to be as cost effective as possible to minimise budget increases. However, it was recognised that maintaining centralised databases and information repositories, and a Data

Management section able to complete the functions identified by the Scientific Committee in SC-CAMLR-XIV, paragraph 10.8, was much more efficient than the maintenance of such services by individual Members.

4.26 The Commission noted the very positive response the first volume of *CCAMLR Science* has received in the scientific community, and endorsed all the Scientific Committee's recommendations for publications (SC-CAMLR-XIV, paragraphs 12.1 to 12.4). It further noted the high level of intersessional activity of the Scientific Committee (SC-CAMLR-XIV, paragraphs 13.1 to 13.7), and encouraged the Committee to continue cooperation with other international organisations (SC-CAMLR-XIV, section 11).

#### Implications of an Integrated Approach to Management

4.27 The Commission noted with satisfaction that the amalgamation of the Working Group on Krill (WG-Krill) and the Working Group for the CCAMLR Ecosystem Monitoring Program (WG-CEMP) into a new group, the Working Group on Ecosystem Monitoring and Management (WG-EMM), had proved extremely effective in advancing the Scientific Committee's work on ecosystem assessment.

4.28 The Commission noted the progress made towards an understanding of what an ecosystem assessment entails, and towards the formulation of a strategic model which incorporates biological, environmental and fishery components, the links between them, the procedures for ecosystem assessment and for the provision of management advice, and the resulting management actions (SC-CAMLR-XIV, paragraphs 5.4 to 5.6). The Commission noted that this is the first time that a strategy for developing an ecosystem assessment for the Antarctic has been explicitly mapped out.

4.29 The Commission congratulated the Scientific Committee on its continuing progress towards transition from a qualitative to a quantitative ecosystem assessment and encouraged work on the many analyses and models being developed by WG-EMM to integrate into its strategic model (SC-CAMLR-XIV, paragraphs 3.25 and 5.11 to 5.17).

4.30 The Commission noted the Scientific Committee's advice on the nature and significance of potential overlap between the location of krill harvesting and the foraging areas of krill-dependent predator species (SC-CAMLR-XIV, paragraphs 5.18 to 5.23), and that:

- (i) there is a continuing need to ensure that krill catches are not concentrated in small areas and over short periods of time to such an extent that local populations of dependent species may be adversely affected;
- (ii) when determining precautionary catch limits, and subdividing precautionary limits set for larger areas, as much relevant environmental and biological information as is possible should be used; and
- (iii) a valuable new thrust towards achieving these goals is the proposal to make use of predator food consumption data.

4.31 The US noted that while the primary concern of paragraph (i) above and the calculations currently being carried out by the Scientific Committee were directed at land-based predators during the breeding season (SC-CAMLR-XIV, paragraphs 5.18 to 5.20), in its work the Scientific Committee should also bear in mind other dependent species, and times other than the breeding periods of land-based predators.

4.32 Japan stated that in relation to paragraph 5.22(i) of SC-CAMLR-XIV, the scientific papers presented in the past by Japanese scientists indicated that there was no significant overlap between land-based predators' foraging areas and krill harvesting in Subarea 48.1 (e.g., SC-CAMLR-XIII, Annex 7, paragraph 4.1). Japan also expressed its belief that Article II of the Convention should not be interpreted in any way which would require conservation measures to be framed such that predator needs always outweigh the interests of fisheries. In this connection, Japan, although not objecting to the approach envisaged in paragraph 5.22(iii) of SC-CAMLR-XIV being pursued by WG-EMM, could not endorse this approach as a sound and practical one at this time and reserved its position until more balanced approaches are developed.

4.33 The UK noted that the conclusions, advanced by Japanese scientists in their papers on the issue referred to above, had been subject to reservations from WG-CEMP and the Scientific Committee (e.g., SC-CAMLR-XIII, paragraph 7.29 and SC-CAMLR-XIII, Annex 7, paragraph 4.3). The UK further noted that Article II of the Convention, while not specifying primacy either to harvesting or dependent species, requires that harvesting be conducted in accordance with provisions of a precautionary nature to protect dependent species. The UK expressed surprise that Japan was unable to endorse the unanimous conclusion of WG-EMM and the Scientific Committee that the approach referred to in paragraph 5.22(iii) of SC-CAMLR-XIV represented a valuable advance in the development of precautionary approaches to local-scale interactions between commercial fisheries and dependent predators.