

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 and research and data requirements of the Scientific Committee. Substantive matters arising from the deliberations of the Scientific Committee were discussed under other parts of the agenda: illegal, unregulated and unreported (IUU) fishing (section 5), incidental mortality and marine debris (section 6), new and exploratory fisheries (section 7), CCAMLR Scheme of International Scientific Observation (section 8), management under uncertainty (section 10) and assessment of proposals for Antarctic Specially Protected Areas (ASPAs) (section 11).

Intersessional Activities

4.2 Six CCAMLR meetings were held during the 2000/01 intersessional period:

- The International Coordination Subgroup held a three-day workshop in Seoul, Republic of Korea, in June 2001. The workshop was co-convened by Prof. S. Kim and Dr Y. Lee (Republic of Korea), and analysed data from five hydroacoustic surveys conducted in Subarea 48.1 from December 1999 to March 2000. These surveys had been conducted in conjunction with the CCAMLR-2000 Krill Synoptic Survey of Area 48 (CCAMLR-2000 Survey).
- A workshop to consider options for publishing a special issue of papers arising from the CCAMLR-2000 Survey was held in Cambridge, UK, from 30 May to 6 June 2001. It was convened by Dr J. Watkins (UK) and was attended by 15 participants.
- The seventh meeting of the Working Group on Ecosystem Monitoring and Management (WG-EMM) was held from 2 to 11 July in Fiskebäckskil, Sweden. It was convened by Dr R. Hewitt (USA) and was attended by 30 participants.
- A Workshop on Estimating Age in Patagonian Toothfish was held from 23 to 27 July 2001 at the Centre for Quantitative Fisheries Ecology (CQFE), Old Dominion University, Norfolk, Virginia, USA. The workshop was convened by Dr I. Everson (UK) and was attended by 17 participants.
- The Workshop on Approaches to the Management of Icefish (WAMI) was held from 3 to 5 October in Hobart, immediately prior to the meeting of the Working Group on Fish Stock Assessment (WG-FSA). This workshop was co-convened by Drs G. Parkes (UK) and K.-H. Kock (Germany), and was attended by 15 participants.
- The meeting of WG-FSA was held from 8 to 19 October 2001 in Hobart prior to the Scientific Committee meeting. It was convened by Mr R. Williams

(Australia) and was attended by 35 participants. This meeting included a meeting of the ad hoc Working Group on Incidental Mortality Arising from Longline Fishing (WG-IMALF), convened by Prof. J. Croxall (UK).

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

Fishery Status and Trends

4.3 CCAMLR Member countries actively participated in eight fisheries in the Convention Area during the 2000/01 season (1 December 2000 to 30 November 2001) under conservation measures in force:

- exploratory jig fishery for squid (*Martialia hyadesi*) in Subarea 48.3;
- exploratory longline fishery for toothfish (*Dissostichus* spp.) in Subarea 88.1;
- exploratory trawl fishery for spiny icefish (*Chaenodraco wilsoni*) in Division 58.4.2;
- longline and pot fishery for Patagonian toothfish (*Dissostichus eleginoides*) in Subarea 48.3;
- trawl fishery for mackerel icefish (*Champscephalus gunnari*) in Division 58.5.2;
- trawl fishery for mackerel icefish (*Champscephalus gunnari*) in Subarea 48.3;
- trawl fishery for Patagonian toothfish (*Dissostichus eleginoides*) in Division 58.5.2; and
- trawl fishery for Antarctic krill (*Euphausia superba*) in Area 48.

Other fisheries for *D. eleginoides* had taken place within the EEZ of France in Subarea 58.6 and Division 58.5.1, and the EEZ of South Africa in Subareas 58.6 and 58.7.

4.4 Fourteen Members fished: Australia, Chile, France, Japan, Republic of Korea, New Zealand, Poland, Russia, South Africa, Spain, Ukraine, UK, Uruguay and the USA.

4.5 The Commission noted the following points regarding the fishery for krill (*E. superba*) in Area 48:

- 98 414 tonnes of krill have been caught so far in Area 48 in the current 2000/01 season (SC-CAMLR-XX, Table 1). This catch was taken by Japan, Republic of Korea, Poland, Ukraine and the USA.

- 114 425 tonnes of krill had been caught in Area 48 in the previous 1999/2000 season (Subarea 48.1 – 71 977 tonnes, Subarea 48.2 – 16 891 tonnes and Subarea 48.3 – 25 557 tonnes) (SC-CAMLR-XX, Table 2).
- Fishing activity in Area 48 has shifted towards Subareas 48.1 and 48.2 during the austral autumn and winter since 1996. Easier access through reduced sea-ice extent was recognised as a major factor influencing this change in the fishery.
- The Scientific Committee had noted the growing value of catch and effort data from the Japanese fishery and had encouraged submission of similar data from other participants in the fishery. The value of data reported in a systematic and compatible fashion was emphasised and a high priority was assigned to re-examining the use of indices derived from these data.
- The Scientific Committee had requested updated information on krill processing, market developments, economic analyses and any other information that may assist WG-EMM in monitoring the development of the krill fishery.

4.6 The Commission noted Members' plans for krill fishing during the 2001/02 season: Japan expects to have three vessels catching ~65 000 tonnes; Republic of Korea, one vessel catching ~8 000 tonnes; Poland, three vessels; Ukraine, three to four vessels catching ~40 000 to 50 000 tonnes; Uruguay, one vessel; and the USA, two vessels. At the time of adoption, Russia announced that it may also participate in this fishery with one or two vessels.

4.7 Ukraine stated that its level of participation in the krill fishery in 2001/02 would depend on prevailing economic factors.

4.8 The Commission noted with concern that the expected catch in 2001/02 could be about 50% higher than the catch in 2000/01 based on these fishing plans. While an increase in the current level of catch of this magnitude is small in comparison with the precautionary catch limit in Area 48, such an increase in catches may have a substantial local effect, if these catches were taken in a small area and at a time of low krill abundance. The Commission noted the Scientific Committee's work plan for the development of small-scale management units for the krill fishery (see paragraph 4.13).

4.9 The Commission noted the following points regarding other fisheries in the Convention Area (SC-CAMLR-XX, Tables 1 and 2).

- 9 995 tonnes of *D. eleginoides* have been caught so far in the current 2000/01 season. This catch was taken in Subarea 48.3 (4 055 tonnes), Division 58.5.1 in the French EEZ (2 546 tonnes to 30 June 2001), Division 58.5.2 (2 274 tonnes), Subarea 58.6 in the French (861 tonnes to 30 June 2001) and South African (16 tonnes) EEZs, Subarea 58.7 in the South African EEZ (211 tonnes) and Subarea 88.1 (34 tonnes).

- 16 395 tonnes of *D. eleginoides* had been reported for the previous 1999/2000 season.
- 624 tonnes of *D. mawsoni* have been caught so far in the current 2000/01 season, and this catch was reported from Subarea 88.1. During the previous season, 751 tonnes of *D. mawsoni* were reported from Subarea 88.1.
- 2 368 tonnes of *C. gunnari* have been caught so far in the current 2000/01 season. This catch was taken in Subarea 48.3 (1 429 tonnes) and Division 58.5.2 (938 tonnes). In comparison, 4 200 tonnes of *C. gunnari* were reported in the previous season (Subarea 48.3 – 4 114 tonnes, Division 58.5.2 – 87 tonnes).
- Two other species were targeted in the current 2000/01 season: *C. wilsoni* (Division 58.4.2 – 11 tonnes) and *M. hyadesi* (Subarea 48.3 – 2 tonnes).
- 14 tonnes of crab have been taken so far as by-catch in the pot fishery for *D. eleginoides* in Subarea 48.3 in the current 2000/01 season.

4.10 The Commission noted that the presentation of catch data in Tables 1 and 2 of the report of the Scientific Committee (SC-CAMLR-XX) had been revised as requested (CCAMLR-XIX, paragraphs 4.10 and 4.11; CCAMLR-XVIII, paragraph 8.11).

Dependent Species

4.11 The Commission noted the further development of analyses of data from species monitored under the CCAMLR Ecosystem Monitoring Program (CEMP) and the proposal to undertake a review of CEMP. The Commission noted that WG-EMM would be holding a preliminary session at its 2002 meeting, to address the terms of reference, and to make detailed plans for a workshop to be held in conjunction with the 2003 meeting of WG-EMM (SC-CAMLR-XX, paragraph 4.6).

Harvested Species

Krill Resources

4.12 The Scientific Committee had made progress in the development of management advice in the krill fisheries based on recent research, including:

- the results of the CCAMLR-2000 Survey, and the publication of selected papers in a special issue of the journal *Deep Sea Research* in 2002; and
- the findings of regional surveys conducted in 2000/01.

4.13 As part of this development, the Commission noted that WG-EMM had identified two types of management units:

- small-scale ‘predator units’, based on local predator demand, local krill distribution and fishing fleet patterns (SC-CAMLR-XX, Annex 4, paragraphs 4.4 to 4.11); and
- larger-scale ‘harvesting units’ which were formed by subdividing the large existing statistical areas (SC-CAMLR-XX, Annex 4, paragraphs 4.12 to 4.15).

4.14 The Commission also noted that detailed data from krill fisheries were critical for the development of smaller management units which will need to take into account the behaviour of the fishing fleets (SC-CAMLR-XX, paragraph 5.7). The Commission agreed that there was an urgent need for these data to be reported, and to be reported in a consistent format.

4.15 The Commission reiterated that the advice of the Scientific Committee should be based on the best information available. The Commission noted that haul-by-haul and catch and effort data were routinely submitted from finfish fisheries using the data forms specified in Conservation Measure 122/XIX.

4.16 The Commission noted the Scientific Committee’s caution on the potential for overshooting the catch limit in krill fisheries because of the current method of forecasting the closing date based on catch rates (SC-CAMLR-XX, paragraph 5.19). The Secretariat was requested to review mechanisms that could be used for managing the krill fishery based on periodic reports from the fishery that would be able to ensure that overshoot of the catch limit was unlikely to occur. Although the potential to overshoot currently might not appear critical given the low level of overall catch compared to the precautionary catch limits, it would be important when considering catches in relation to smaller management units.

Finfish Resources

4.17 The Commission noted the recent findings of research on finfish which had been reported to, and taken place during, the meetings of WG-FSA, WAMI and the Workshop on Estimating Age in Patagonian Toothfish.

4.18 In particular, the Commission noted that fisheries for icefish in Subarea 48.3 and Divisions 58.5.1 and 58.5.2 shared many characteristics including: large fluctuations in catch, periods of low or zero commercial catches, reliance of fisheries on few age classes (ages 3 and 4 mainly), and age 5+ fish are poorly represented in survey and commercial catches, suggesting an age-specific increase in natural mortality (SC-CAMLR-XX, paragraph 5.53).

4.19 The Commission also noted that changes in the ecosystem in the recent past may be affecting the dynamics of *C. gunnari* stocks. For the first time, in the context of

Article II, it was conceivable that changes may have occurred in the ecosystem which may not be reversible in two or three decades (SC-CAMLR-XX, paragraphs 5.55 and 5.56).

4.20 The Commission endorsed the management advice for finfish fisheries which had been provided by the Scientific Committee (SC-CAMLR-XX, Section 5).

Other Species

4.21 The Commission noted that the Scientific Committee had not addressed the status of *Electrona carlsbergi* in Subarea 48.3, and no new management advice was available. In the absence of new information from this fishery, Dr Holt advised that the elements of Conservation Measure 199/XIX may be carried forward to the 2001/02 season. Alternatively, the Commission may consider closing this fishery because no fishing had been reported since 1992. Management advice for this species may now be outdated.

4.22 The Commission endorsed the management advice for crab and squid which had been provided by the Scientific Committee (SC-CAMLR-XX, Section 5).

4.23 The Commission endorsed the management advice on by-catch which had been provided by the Scientific Committee (SC-CAMLR-XX, Section 5).

Ecosystem Monitoring and Management

4.24 The Commission encouraged the Scientific Committee to continue considering smaller-scale 'predator units' within the context of the krill fisheries. This work was essential because the Commission was mandated to apply precautionary catch limits to smaller management units in Area 48 once catches of krill in that area in any fishing season reached a trigger level of 620 000 tonnes (Conservation Measure 32/XIX).

4.25 The Commission also encouraged the Scientific Committee to generally review existing statistical boundaries and to develop advice on appropriate ecological or physical units of krill and other stocks.

4.26 The Commission noted that WG-EMM had considered various alternatives for subdividing the precautionary yield of krill in Area 48 so as to avoid the concentration of fishing effort in, and hence excessive catch from, small but critical areas. The existing statistical subareas are too large for this purpose and a method was sought to divide these areas into smaller-scale management units.

4.27 The Commission agreed that the Scientific Committee should develop the concept of 'predator units' as an integral part of establishing smaller-scale management units.

4.28 The Commission noted that the definition of 'predator units' will require information on: (i) local predator foraging ranges and consumption; (ii) krill abundance, dispersion and movement; and (iii) fishing fleet behaviour and patterns of fishing. Available data will be considered at the workshop to be convened during the 2002 meeting of WG-EMM.

4.29 The Commission also noted that the IWC Scientific Committee had successfully developed small-scale management units, and the CCAMLR Secretariat was requested to approach the IWC Secretariat for documents relating to that work.

4.30 The Commission noted that WG-EMM had developed an agenda for its future work over the next several years. The Commission endorsed the goal of this work to define and develop an ecosystem approach to the management of fisheries on Antarctic krill which may also be used as a model for other fisheries regulated by CCAMLR. The Commission also noted that this work would require input from specialists representing a wide range of expertise including resource assessment, statistics and mathematical modelling. The Commission encouraged Members to involve such specialists from their countries in the work of WG-EMM.

Research Exemption

4.31 The Commission encouraged the Scientific Committee to define the minimum level of expected catch which required notification under Conservation Measure 64/XIX (SC-CAMLR-XX, paragraph 8.2).

CCAMLR Data Management

4.32 The Commission noted the main activities of the Data Centre during the 2000/01 intersessional period (SC-CAMLR-XX, Section 10). The Data Centre had continued to support the work of the Commission, Scientific Committee and working groups, including the recently held WAMI.

4.33 One of the Data Centre's key functions was the monitoring of all fisheries conducted under the conservation measures in force. Fishing activities are monitored using the catch and effort reporting system established under Conservation Measures 51/XIX (five-day catch and effort reporting system), 61/XII (10-day catch and effort reporting system) and 40/X (monthly catch and effort reporting system).

4.34 The Commission noted with concern that overdue catch and effort reports continued to jeopardise the Secretariat's ability to monitor fisheries in accordance with conservation measures in force. Twice in 2000/01 Members failed to advise the Secretariat of a vessel's entry into a CCAMLR fishery, and failed to submit five-day catch and effort reports by their respective deadlines. The Secretariat had detected the operation of these vessels through ancillary information. Formal notices were issued under Conservation Measure 51/XIX (paragraph 9), and data were subsequently submitted.

4.35 The Commission agreed that the revision of Conservation Measure 148/XVII (Automated Satellite-linked Vessel Monitoring Systems (VMS)), which had been discussed by SCOI, would alleviate this problem.

Publications

4.36 The eighth edition of *CCAMLR Science* had been published just prior to CCAMLR-XX and was available at the meeting. The Commission thanked Dr E. Sabourenkov (Editor) and other Secretariat staff involved in this publication.

4.37 The following documents were also published in 2001:

- (i) *CCAMLR's Management of the Antarctic*;
- (ii) *CCAMLR Scientific Abstracts*, covering abstracts of papers presented in 2000;
- (iii) *Statistical Bulletin*, Volume 13 (1991–2000); and
- (iv) Revisions of *Scientific Observers Manual*, *CCAMLR Inspectors Manual* and *CEMP Standard Methods*.

4.38 The Commission noted that the Scientific Committee had agreed that the present format and contents of material on the website met its needs and those of its working groups. The Secretariat was thanked for these further developments.

Activities of the Scientific Committee
during the 2001/02 Intersessional
Period

4.39 The Commission noted the work planned by the Scientific Committee for the 2001/02 intersessional period, including:

- a meeting of WG-EMM (5 to 16 August 2002, Montana, USA); and
- a meeting of WG-FSA (7 to 16 October 2002, Hobart, Australia).

4.40 It was indicated that the work of the Scientific Committee would be assisted by the presence of more scientists with modelling and statistical expertise at working group meetings. The Commission requested that Members endeavour to provide scientists with this expertise to the coming intersessional meetings and into the future.

Scientific Committee Budget

4.41 The Commission endorsed the budget of the Scientific Committee for 2002, and the forecast budget for 2003 (SC-CAMLR-XX, section 14), including:

- the report of the 2002 meeting of WG-EMM will include the findings from two workshops, resulting in a report of approximately the same size as the report in 2000; and
- WG-FSA's newly formed otolith exchange network would look into the feasibility of holding a workshop in 2003 to examine the techniques for determining the age of *C. gunnari*. The approximate cost of this workshop was included in the 2003 forecast budget.

4.42 The Commission also endorsed the following expenditures under its budget for 2002:

- participation by the Chair in the 2002 meeting of CEP;
- participation of the Data Manager in the 2002 intersessional meeting of CWP;
- development of computing facilities in support of data management;
- publication of laminated waterproof species identification sheets; and
- a contribution to the cost of publishing the results of the CCAMLR-2000 Survey in a special issue of *Deep Sea Research*.

Vice-Chairs of the Scientific Committee

4.43 The Commission congratulated Dr S. Kawaguchi (Japan) and Mr L. López Abellán (Spain) on their appointment as Vice-Chairs of the Scientific Committee. The Commission thanked Drs E. Fanta (Brazil) and S. Nicol (Australia), outgoing Vice-

Chairs, for their contribution to the work of the Scientific Committee during their two-year term.

4.44 The Commission noted that Dr Everson had agreed to convene the 2002 meeting of WG-FSA and that Dr S. Hanchet (New Zealand) will assume the convenership in 2003. The Commission thanked Mr Williams for his excellent leadership of WG-FSA during the last three years.

4.45 The Commission thanked Dr Holt for his comprehensive report, and his leadership during his first year as Chair of the Scientific Committee.