ASSESSMENTS AND MANAGEMENT ADVICE

New and exploratory fisheries

5.1 CCAMLR-XXIII/38 addressed the Commission's request that the Secretariat develop a procedure for forecasting closures in SSRUs (CCAMLR-XXII, paragraph 9.20). Key points of relevance to WG-FSA were summarised by Dr Ramm. WG-FSA noted that in 2003/04 the Secretariat had monitored 155 catch limits. A number of difficulties had been encountered while monitoring, and these had resulted in eight instances where catches exceeded their catch limits (over-runs). Factors which contributed to the over-runs included rapid changes in fishing pattern; the late submission of catch and effort reports; difficulties in forecasting closures in SSRUs, time lags and small catch limits, failure to monitor all by-catch species codes, and an unexpected communication problem between the Secretariat, a Member and its flagged vessels. As a result, the Secretariat had identified a number of changes which may improve the monitoring and management of CCAMLR fisheries.

5.2 The Working Group noted that the paper had implications for management which were not within the remit of Working Group. Those aspects of the paper however that would impact on the work of WG-FSA were discussed; particularly the issue of large numbers of vessels fishing in SSRUs which might impact on the ability of the Working Group to adequately interpret CPUE data and also affect the efficacy of the move-on rule to limit by-catch in the fishery.

5.3 The Working Group noted that there were alternative options for managing catch limits in SSRUs that could also be examined, such as:

- improving the forecasting methods for predicting closure
- multi-year catch limits
- open/closed SSRUs.

5.4 SC-CAMLR-XXIII/7 by the Delegation of Ukraine proposes amending a number of conservation measures that relate to exploratory *Dissostichus* spp. fisheries in Subarea 88.1 (Conservation Measure 41-09), Division 58.4.2 (Conservation Measure 41-05) and Division 58.4.1 (Conservation Measure 41-11).

5.5 SC-CAMLR-XXIII/7 stated that the proposed amendment to Conservation Measure 41-09 in Subarea 88.1 is based on the assumption that an error was made in the allocation of catch limits for *Dissostichus* spp. between SSRUs in Subarea 88.1 because 'the historical fishery data used were principally those for the year in which the fishery was conducted only by New Zealand which fished virtually throughout the whole of the Ross Sea because of the abnormally warm summer'.

5.6 The Working Group noted that this was incorrect, pointing out that the analysis to estimate fish density in each SSRU was based on the total catch of *Dissostichus* spp. divided by total effort by all vessels in each SSRU over the history of the fishery using a data extract made by the Secretariat during WG-FSA in 2003 (SC-CAMLR-XXII, paragraph 5.37). Thus, the allocation of catch limits already fulfils suggestion 3 of SC-CAMLR-XXIII/7, namely that one of the main criteria for allocating catch limits between SSRUs should be average CPUE from historical fishery data for all vessels.

5.7 The amendment to Conservation Measure 41-05 proposed in SC-CAMLR-XXIII/7 suggested:

(i) Australia provides a report on the implementation of paragraph 3 of Conservation Measure 41-05;

(ii) the deletion of paragraph 3 of Conservation Measure 41-05 based on the 'triviality of the argument for the protection of benthic communities' and 'taking into consideration the large numbers of vessels and uncertain ice conditions';

(iii) setting a catch limit for each SSRU in Division 58.4.2 of at least 500 tonnes of *Dissostichus* spp., i.e. no less than 2 500 tonnes for the whole division;

(iv) to allow only one vessel from each country to fish in the division during the forthcoming season;

(v) to allow each vessel to harvest no more than 200 tonnes of fish in each SSRU in Division 58.4.2.

5.8 The amendment to Conservation Measure 41-11 proposed in SC-CAMLR-XXIII/7 suggested:

(i) the deletion of paragraph 3 of Conservation Measure 41-11 based on the 'triviality of the argument for the protection of benthic communities' and 'taking into consideration the large numbers of vessels and uncertain ice conditions';

(ii) a catch limit of not more than 150 tonnes of *Dissostichus* spp. be set for each SSRU in Division 58.4.1, i.e. no less than 1 200 tonnes for the whole division;

(iii) to allow only one vessel from each country to fish in the division during the forthcoming season;

(iv) that each vessel be allowed to harvest no more than 70 tonnes of fish in each SSRU in Division 58.4.1.

5.9 Dr Constable noted that Australia had provided a report to WG-FSA this year on its fishing activities in Divisions 58.4.2 and 58.4.3b (WG-FSA-04/66). Additionally, research trawls in Division 58.4.2 by Australia had demonstrated that there were significant benthic communities present in waters shallower than 600 m which would be likely to be negatively impacted on by commercial fishing. In addition, recent video footage taken during a research cruise in Prydz Bay (Division 58.4.2) showed substantial abundance and diversity of benthic communities on the shelf areas.

5.10 For operational reasons related to ice conditions in high latitudes and in order to fulfil requirements in terms of research sets, it may be necessary to have the entire (10°) SSRU either open or closed rather than half the SSRU, consistent with the approach adopted for Division 58.4.1 at CCAMLR-XXII (Conservation Measure 41-11).

New and exploratory fisheries in 2003/04

5.11 Ten conservation measures relating to 12 exploratory fisheries were in force during the 2003/04 season, but fishing only occurred in respect of five measures and five fisheries. There was no reported fishing activity with respect to the following areas: Subarea 48.6 south of 60°S, Divisions 58.4.1 and 58.4.3a (Table 5.1).

5.12 Fishing occurred only with respect to the following fisheries: Subarea 48.6 north of 60°S (7 tonnes), Divisions 58.4.2 (20 tonnes), 58.4.3b (7 tonnes), Subareas 88.1 (2 166 tonnes) and 88.2 (375 tonnes) (Table 5.1). Fishery Reports have been prepared for Subareas 88.1 and 88.2 as these were the only two areas with significant levels of fishing activity.

Table 5.1: Summary table for exploratory fisheries in 2003/04.

Exploratory fisheries in Area 48 (Atlantic Ocean sector)

Subarea/Division	Member	Number of vessels		Reported catch (tonnes) of *Dissostichus* spp.
		Notified	Fishing	
48.6 north of 60°S	Argentina	2	0	
	Japan	1	1	
	Namibia*	6	0	
	New Zealand*	3	0	
	South Africa*	2	0	
	Spain	1	0	
Total	6	15	1	7
48.6 south of 60°S	Argentina	2	0	
	Namibia*	6	0	
	New Zealand*	3	0	
	South Africa*	2	0	
	Spain	1	0	
Total	5	14	0	0

* Withdrawn

Exploratory fisheries in Area 58 (Indian Ocean sector)

Subarea/Division	Member	Number of vessels		Reported catch (tonnes) of *Dissostichus* spp.
		Notified	Fishing	
58.4.1	Argentina	2	0	
	Australia	1	0	
	Namibia*	1	0	
	USA	2	0	
Total	4	6	0	0
58.4.2	Argentina	2	0	
	Australia	3	1	
	Namibia*	2	0	
	Russia	4	0	
	Ukraine	2	0	
	USA	2	0	
Total	6	15	1	20

(continued)

Table 5.1 (continued)

Subarea/Division	Member	Number of vessels		Reported catch (tonnes) of *Dissostichus* spp.
		Notified	Fishing	
58.4.3a	Argentina	2	0	
	Australia[+]	3	0	
	Namibia[*]	2	0	
	Russia	4	0	
	Ukraine	2	0	
	USA	2	0	
Total	6	15	0	0
58.4.3b	Argentina	2	0	
	Australia	3	1	
	Namibia[*]	2	0	
	Russia	4	0	
	Ukraine	2	0	
	USA	2	0	
Total	6	15	1	7

[*] Withdrawn [+] Trawl notification withdrawn

5.13 In most of the active exploratory fisheries, the fishing effort was low and the catches reported were relatively small. As has been the case for the last few years, the notable exception was the exploratory fishery for *Dissostichus* spp. in Subarea 88.1 conducted under Conservation Measure 41-09. A total of 2 166 tonnes of *Dissostichus* spp. was taken against a catch limit of 3 250 tonnes (paragraphs 5.50 to 5.53 and Table 5.2).

5.14 The total catch limit of 375 tonnes was taken solely by New Zealand in the exploratory *Dissostichus* spp. fishery in Subarea 88.2 (paragraph 5.56 and Table 5.3).

5.15 The exploratory fishery in Division 58.4.2 was undertaken by one Australian-flagged vessel which caught 20 tonnes of *Dissostichus* spp. against a catch limit of 500 tonnes. Fishing was carried out in SSRUs D and E (WG-FSA-04/66).

5.16 An exploratory fishery in Division 58.4.3b was undertaken for the first time by one Australian-flagged vessel which caught 7 tonnes of *Dissostichus* spp. against a catch limit of 300 tonnes (WG-FSA-04/66).

5.17 The exploratory fishery in Subarea 48.6 (north of 60°S) was undertaken by one Japanese-flagged vessel which caught 7 tonnes against a catch limit for *Dissostichus* spp. of 455 tonnes.

5.18 As part of Conservation Measure 41-01 all vessels are required to carry out a research plan which includes completing a minimum number of research sets on entering an SSRU. An extract of fine-scale data of vessels fishing in new and exploratory fisheries prepared by the Secretariat during the meeting was analysed by vessel and SSRU. The Working Group welcomed the results from some vessels which exceeded their required quota of research sets. However there were a number of instances (17%) where vessels failed to complete any research sets. There were also many cases where a vessel conducted some research sets but failed to complete the required quota (11%) even though more commercial sets were completed. Thus, in 28% of cases the required number of research sets were not completed as

required under Conservation Measure 41-01. The Secretariat noted that it is unable to determine whether the above cases are because research sets were not done or because they were not submitted or specified correctly as research sets. The Working Group reiterated the necessity for submission of data under Conservation Measure 41-01 and urged Members to ensure that the required research sets are completed and data submitted to the Secretariat in a timely manner and accurate format.

5.19 An additional requirement specified in Conservation Measure 41-01 is that each longline vessel fishing in exploratory fisheries for *Dissostichus* spp. is required to tag and release *Dissostichus* spp. at the rate of one toothfish per tonne of green-weight catch throughout the season. Only six vessels out of 26 vessels fishing have reported tagging *Dissostichus* spp. in new and exploratory fisheries. The numbers of toothfish tagged by these six vessels were 4, 11, 9, 4, 49 and 216 respectively. There was not enough time available at the meeting to determine how these tag rates corresponded to the catch weight of *Dissostichus* spp. and whether they fulfilled the requirements of Conservation Measure 41-01. In addition, the Secretariat noted that there was reference to tagging in some observer reports from other vessels but that no tagging data was submitted. The Working Group noted its concern that the tagging requirements, as specified in Conservation Measure 41-01, were not being met by all vessels. It reiterated the importance for Members to conduct tagging and to submit data in accordance with Conservation Measure 41-01.

5.20 The Working Group noted that some sets or hauls reported as commercial data may meet the requirements of a research set/haul if they were separated by the required minimum distance, included the required number of hooks and satisfied the required soak time/effective fishing time. The Working Group suggested that the Secretariat could investigate methods for identifying sets that matched the criteria of the research plan under Conservation Measure 41-01 (e.g. 'Data Loser' (SC-CAMLR-XX, Annex 5, paragraph 4.31) although additional algorithms that incorporated soak time and number of hooks would need to be included). This data could then be used to investigate the spatial distribution of fishing effort/catch rates.

5.21 WG-FSA requested advice from the Scientific Committee regarding presentation of the data on research sets and tagging rates completed by Members as required under the Research and Data Collection Plan in Conservation Measure 41-01.

New and exploratory fisheries in 2004/05

5.22 A summary of new and exploratory fisheries notifications for 2004/05 is given in Table 1 of SC-CAMLR-XXIII/BG/3.

5.23 No notifications have been received from Members for exploratory fisheries in closed areas.

5.24 No notifications have been made for new fisheries.

5.25 Thirteen Members submitted a total of 26 notifications for exploratory fisheries for *Dissostichus* spp. in Subareas 48.6, 88.1, 88.2 and Divisions 58.4.1, 58.4.2, 58.4.3a and 58.4.3b.

Notification for exploratory bottom trawling in Subarea 48.3

5.26 There was one notification for an exploratory bottom trawl fishery for *C. gunnari* in Subarea 48.3. Although not strictly requiring notification under the exploratory fishery measure (Conservation Measure 21-02), WG-FSA welcomed the submission of this proposal for the group's consideration.

5.27 Concern about by-catch of fish species such as *Chaenocephalus aceratus*, *Pseudochaenichthys georgianus*, or *Gobionotothen gibberifrons*, had initially led to the prohibition on the use of bottom trawls in the directed fishery for *C. gunnari* in Subarea 48.3.

5.28 Dr D. Agnew (UK) explained that the motivation behind the proposal for an exploratory bottom trawl fishery in Subarea 48.3 (CCAMLR-XXIII/16) was to find a method of fishing, combining both bottom and midwater trawls that would reduce the impact of the icefish fishery on birds while minimising, as far as possible, impacts on benthos. The proposal formed part of industry initiatives to reduce bird by-catch, including trials of the various mitigation measures detailed in paragraphs 7.218 to 7.220. The icefish fishery in Division 58.5.2 successfully uses bottom trawls with low adverse impacts on benthos, other fish or birds, and the proposal intended to make use of the experience and gear technology currently being employed in that division in application to Subarea 48.3.

5.29 The exploratory fishery would undertake rigorous monitoring of benthic impacts and fish by-catch during bottom trawls and seabird interactions throughout. By-catch of fish would be counted against the catch limits in Conservation Measure 33-01. The proposal analysed the distribution of sensitive benthos (sponges and corals) encountered in the UK bottom trawl surveys, finding that they were most abundant in the east of the South Georgia shelf. The proposal defined an area for the bottom trawl fishery to avoid these concentrations, restricting it to the west and northwest of the shelf.

5.30 Some members felt that it would be very difficult to assign certain fishing areas to a commercial fishery in advance. Any commercial fishery is likely to move to areas where fish concentrations are being found irrespective if it is in the west or the east of the island. Dr Agnew confirmed that the vessel would not be permitted to fish with bottom trawls outside the defined area.

5.31 Some members were concerned that bottom trawling in this area would cause undue damage to by-catch species and benthic communities, at least locally, even if a light ground tackle is used. They advised against any bottom trawl fishery for icefish in Subarea 48.3. These members felt other mechanisms for reducing seabird mortality should be investigated, and that bottom trawling should not be resumed at the current state.

5.32 Dr C. Jones (USA) noted that in his opinion the maps of abundance and composition of benthic invertebrates from the ICEFISH 2004 cruise (WG-FSA-04/61) largely conflicted with the benthos impact maps set out in the UK notification. The ICEFISH cruise demonstrated sponge dominated communities on the northern and eastern shelf areas that were consistent with the results from the UK surveys. The ICEFISH cruise found also that the western part of the shelf in the proposed bottom trawling areas contained areas with high abundance of invertebrate communities that, although dominated by echinoderms, included abundant hexactinellids (glass sponges) and corals. In contrast, the UK fish surveys found sparse to absent 'key benthic species' in this area.

5.33 Dr Agnew commented that the differences between the benthos distribution data presented in CCAMLR-XXIII/16 and WG-FSA-04/61 were probably due to sampling method and survey design. The UK bottom trawl surveys covered a much wider area and undertook more hauls than the ICEFISH 2004 cruise (WG-FSA-04/61), but the latter used gear that fished closer to the seabed.

5.34 Given the fact that the design of the ground tackle and other parts of the front end of the net may have a significant effect on the ability of the net to catch benthos and non-target species, Dr K.-H. Kock (Germany) suggested that in undertaking such an assessment, the involvement of a gear technology specialist would be useful.

5.35 Another reason why some members were opposed to the resumption of bottom trawling in Subarea 48.3 was the potential for negative impacts on fish by-catch. A recently discovered nest-guarding parental care strategy used by *C. aceratus* is presented in WG-FSA-04/26. This species, as well as others that exhibit this strategy of parental care, would be seriously impacted by fishing techniques that damage the seabed, such as bottom trawling at the time *C. aceratus* and possibly other species guard their nests.

5.36 Dr Agnew pointed out that *C. aceratus* spawn in March–May at South Georgia (Kock, 1992) which is likely to be after the experimental bottom trawl fishery. By-catch limits are set for *C. aceratus* in Conservation Measure 33-01.

5.37 The Working Group recognised that in order to assess the likely impact of a future bottom trawl fishery on benthos, it would be necessary for the experimental fishery to obtain information on benthos over a significant part of the proposed area. It recalled the method for exploring the potential impacts of bottom trawling in new and exploratory fisheries undertaken in Division 58.4.2 (Conservation Measure 43-04). The Working Group considered that the rockhopper gear that would be used might not sample benthos efficiently. It recommended that the vessel should undertake experimental work by deploying a trawl that could fish closer to the bottom, such as a beam trawl, in order to better sample benthos. Such work should be sufficient to provide coverage of the area to determine how effectively the rockhopper gear retains by-catch of benthos as well as to indicate the relative abundance of benthos in the areas most likely to be fished into the future compared to other areas.

5.38 Some members recommended that an assessment of the potential for a bottom trawl fishery for icefish in Subarea 48.3 should be made following the conclusion of the experimental fishery. This assessment should consider the potential contribution of bottom trawling to minimising the by-catch of birds in the icefish fishery, as well as the impacts on benthos and mitigation of those impacts. The UK was requested to ensure that the data collected were sufficient to enable this analysis.

5.39 Other members felt that it would be unwise to embark on the reintroduction of any bottom trawling in Subarea 48.3.

Notifications for exploratory *Dissostichus* spp. fisheries

5.40 The numbers of vessels notified for exploratory fisheries for *Dissostichus* spp. in 2004/05 are shown, grouped by subarea or division, in Table 2 of SC-CAMLR-XXIII/BG/3.

All notifications were submitted by the deadline. As was the case last year, there were multiple notifications of exploratory fisheries for *Dissostichus* spp. for several subareas or divisions.

5.41 In 2003, the Commission introduced a cost recovery system in new and exploratory fisheries. It was agreed that a payment of A$8 000 should accompany each notification of a new and exploratory fishery (CCAMLR-XXII, paragraphs 3.16 to 3.23). This payment consists of a fee of A$3 000, representing the recovery of administrative costs, and a sum of A$5 000 to be refunded on commencement of fishing in accordance with the conservation measures in force.

5.42 There have been a very large number of notifications for fishing in Subareas 88.1 (10 notifications for up to 21 vessels), 88.2 (five notifications for up to 10 vessels) and Subareas 48.6 and Divisions 58.4.1, 58.4.2 and 58.4.3b (between 7 and 11 vessels). Depending on the size of the precautionary catch limits, this implies that if all vessels operated simultaneously, the available catch per vessel could be lower than that required for economic viability, especially for those vessels operating in high latitudes where fishing imposes considerable operational difficulties.

5.43 The large number of notifications for exploratory fisheries, if translated into a large number of vessels fishing, may lead to issues with the standardisation of CPUE data for assessments (WG-FSA-04/25; Fishery Report for Subareas 88.1 and 88.2, paragraph 5.68) and may also reduce the effectiveness of the move-on rule for by-catch (paragraphs 6.72 and 6.73).

5.44 The Working Group noted that it is likely that there will be additional administrative problems in determining closure dates for fishing in SSRUs when many vessels are fishing simultaneously in a subarea or division (CCAMLR-XXIII/38).

5.45 WG-FSA-04/18 summarised a proposal by the Delegation of Japan to extend the fishing season for the exploratory fishery for *Dissostichus* spp. in Subarea 48.6 in the 2004/05 season. The fishing season is defined under Conservation Measure 41-04 (2003) as being 'from 1 March to 31 August'. The proposed extension would change this definition to 'from 1 December to 31 August'. This proposal is discussed under Item 7 where it was noted that it does not conflict with the IMAF assessment (paragraphs 7.193 to 7.196 and Table 7.16).

5.46 SC-CAMLR-XXIII/BG/19 proposed conducting an experimental set-up of combined bottom-vertical longlines for the exploratory fisheries for *D. mawsoni* in Subareas 88.1 and 88.2 in order to determine whether *D. mawsoni* occur in the meso- and bathypelagic areas. The Working Group encouraged work of this kind and noted that this experiment should be conducted within the guidelines of existing conservation measures and noted that there may be implications for IMAF depending on the sink rate of lines and whether hooks were set at the surface. In addition, the Working Group noted that if the objective is to estimate the depth range at which *Dissostichus* spp. may be caught, then a series of longlines could be set, each longline with hooks in a particular depth band. If each line has hooks at all depths then fish may follow the 'food trail' up the longline thus confounding results.

Progress towards assessments of new and exploratory fisheries

5.47 The Working Group was unable to develop management advice based on assessments of yield and is therefore unable to provide any new advice on catch limits for any of the exploratory fisheries.

5.48 Given the large number of notifications for the 2004/05 fishing year, the Working Group reiterated the urgent need to develop a means for estimating abundance and providing assessments of stock status for exploratory fisheries.

5.49 WG-FSA-04/36 and WG-FSA-SAM-04/8 detailed methods and approaches that might be used to monitor abundance and estimate precautionary yields. These issues, in relation to progress towards an assessment in Subarea 88.1 and future research requirements, are discussed in detail in the Fishery Report for Subareas 88.1 and 88.2, paragraphs 5.69 to 5.75.